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JANUARY, 1945

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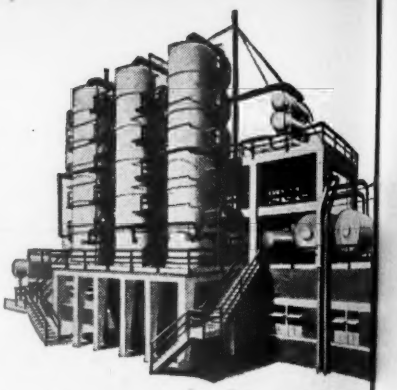

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A Decade Passes

THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Celebrates Its Tenth Anniversary

On December first and second, 1944, the National Society of Professional Engineers held its 10th Annual Meeting. The completion of its first decade as the national organization of the several state professional engineering societies of the United States was an auspicious occasion with representation from numerous other national engineering societies and groups, together with guests from Canada, distinguished visitors from this nation and delegates from a score of state societies, in attendance.

The dinner, which took place on the evening of December first was an event of unusual excellence. Addressed by President Harry S. Rogers of the Society for the Promotion of Engineering Education and of the Polytechnic Institute of Brooklyn, President de Gaspé Beaubein of the Engineering Institute of Canada, and the famed aeronautical engineer Major Alexander P. de Seversky, the five hundred persons present were rewarded with three of the best prepared messages ever delivered at an engineering gathering. The introductory remarks and the presentation of the speakers by Past President Fairman of the New York State Society were in themselves so well phrased and so neatly turned as to be worthy of the best traditions of an ancient calling seeking its place among the learned professions of today.

The Saturday luncheon, with some 300 present, was addressed by Dr. Carl Svensen, retiring President of the National Council of State Boards of Engineering Examiners, and, Past President of N.S.P.E. John C. Riedel, who spoke in behalf of Mayor La Guardia, the latter having been detained in Chicago at the Airways Conference. Brief remarks were also made by ten of the fathers of the N.S.P.E. movement. President George Krueger of the New Jersey Society did an excellent job as presiding officer.

The various business sessions of the Directors, of the Committees and of the Delegates were attended by representatives of some twenty state organizations. Reports from the officers and chairmen of committees indicated that the Society was progressing at an accelerating pace. Membership increased about 2000 during the year 1944. Four new Societies, Minnesota, Georgia, Wisconsin and Kansas were admitted and several others are in the process of organization or reorganization. The report of the President will appear in a subsequent issue as an annual statement. Chairman Paine in the report of the Public Relations Committee outlined a program that calls for real cooperative action from all chapters and state organizations.

Two items which provoked considerable discussion were Collective Bargaining and the rewriting of Registration Laws in the light of the recent decision of the Illinois Supreme Court. The economic status of the engineer, as an objective of the Society, is to be stressed and reports on the effects and possibilities of collective bargaining are to be made at frequent intervals. It was pointed out that various state societies and chapters could represent engineers, if requested to do so. Several successful examples of such representation have occurred during the past year. The following resolution bearing on the Fair Practice Labor Regulations was approved:

Whereas, the Board of Directors of the National Society of Professional Engineers approved at a previous meeting the proposal of the Minnesota Association of Professional Engineers that Section 541.3 of the regulations of the Fair Labor Standards Board be amended by inserting after the word "medicine" in the sixth line thereof the words "or professional engineers", and

Whereas, the legal counsel of our Employment Practices Committee has advised that in order to obtain official recognition and consideration of our said proposal the National Society of Professional Engineers should promptly file a formal petition with the Fair Labor Standards Board in Washington requesting said change in the regulations, and also requesting a hearing on the petition at some convenient place and time to be agreed upon, and also asserting the willingness of representatives of N.S.P.E. to appear at said hearing and give testimony as to why this change should be made:

Now Therefore Be It Resolved by the Board of Directors of the National Society of Professional Engineers that it hereby empowers and instructs its President to proceed in accordance with the foregoing advice of the said legal counsel and take the necessary steps to have said petition prepared and filed and to see that said hearing is held and that a goodly number of duly qualified witnesses from among our members appear and give testimony at said hearing to the end that this result which we have long been talking about and hoping for may be accomplished.

President Nold counseled against reverting to engineering and technical methods of writing legislation, especially definitions, and used the type of definition employed in Legal Practice Acts as a possible solution to some of the difficulties encountered in writing Engineering Registration Acts.

The results of the balloting indicated that the Constitutional Amendment had been carried by an overwhelming majority. As a result, the Society is now functioning in accordance with the revised instrument which permits the Board of Directors to fix the dues within certain limitations. Tabulation also revealed that the following had been elected to direct the affairs of the Society during the year 1945:

President—Harry E. Nold, Columbus, Ohio
Treasurer—Leo H. Cleary, Washington, D. C.
Vice-President—
Northeastern Zone—Ritchie Lawrie, Jr., Pennsylvania
Central Zone—Bruce Williams, Missouri
Southern Zone—A. F. Mitchell, Texas
Western Zone—William L. Thrailkill, Washington

The Nominating Committee for the year 1946, elected at the meeting, consists of Past Presidents of N.S.P.E., Col. John W. Beretta of Texas and Dean Elmer Holbrook of Pennsylvania, National Director L. E. Petersen of Wisconsin, Past President of the Ohio Society, William C. Kammerer and National Director John W. Shallenberger of Connecticut. The task of the committee calls for months of deliberation. It solicits the assistance of the membership. The future of N.S.P.E. depends to a considerable extent upon the recommendations of this committee.

10th ANNUAL MEETING

DAIS — FRIDAY, DECEMBER 1st, 1944

William H. Larkin, Vice-President—N.Y.S.S.P.E.; Clarence W. Post, President—N.Y.S.S.P.E.; Hale Sutherland, President—P.S.P.E.; L. Austin Wright, Secretary—E.I.C.; John W. Beretta, Past President—N.S.P.E.; George T. Seabury, Secretary—A.S.C.E.; David B. Steinman, Past President—N.S.P.E.; A. B. Parsons, Secretary—A.I.M.M.E.; C. George Krueger, President—N.J.S.P.E.; Robert M. Gates, Past President—A.S.M.E.; Carl L. Svensen, Past President—N.C.S.B.E.E.; Harry S. Rogers, President—S.P.E.E.; Alexander P. deSeversky, Engineer & Scientist; James F. Fairman, TOASTMASTER; deGaspe Beaubien, President—E.I.C.; Harry E. Nold, President—N.S.P.E.; Charles A. Powel, President—A.I.E.E.; John C. Riedel, Past President—N.S.P.E.; Col. Clarence E. Davies, Secretary—A.S.M.E.; Everett S. Lee, Chairman—E.C.P.D.; Arthur V. Sheridan, Past President—N.S.P.E.; Henry H. Henline, Secretary—A.I.E.E.; Leo H. Cleary, Treasurer—N.S.P.E.; R. L. Sackett, Secretary—E.C.P.D.; Frederick H. Zurmuhlen, Vice-President—N.S.P.E.; S. L. Tyler, Secretary—A.I.Ch.E.; James D. Skinner, President—Conn. Soc. Prof. Engrs.; Edward Larson, Executive Secretary, N.S.P.E.

N. S. P. E. Host To Many Societies

ON THE OCCASION OF ITS 10th ANNUAL DINNER

DISTINGUISHED SPEAKERS DELIVER ADDRESSES

AT SESSION WHICH CLIMAXED THE ATTAINMENT

OF AN IMPORTANT MILESTONE

IN SOCIETY'S HISTORY

With some five hundred persons present, the 10th Annual Dinner of the National Society of Professional Engineers was an event that served to establish the growth and the role of the professional movement among engineers.

As ages go, N.S.P.E. is but approaching adolescence, but the constant growth and vigor of the youthful organization of the professional practitioner of the country have been such as to suggest that the engineering profession will, before another decade has passed, have a National Society fully as representative and equally as potent, as the American Bar and American Medical Associations.

Starting with four eastern state organizations, Connecticut, New York, New Jersey and Pennsylvania, the National Society has expanded across the country reaching as far south as Texas, and as far north and west as the state of Washington. The center of gravity of the SOCIETY enrollment as well as that of its influence has moved steadily westward and there is little doubt that the next ten years will witness the emergence of the National Society of Professional Engineers as the unchallenged spokesman for the professional practitioners of the nation as a whole.

Following a day devoted to the business for which the annual meeting was held, the dinner served to dramatize the accomplishments and aspirations of an organized endeavor premised upon the belief that through the medium of licensing or registration a great calling, which has for years been divided as a result of ever increasing and misleading subdivisional emphasis, could be reorganized and reunited into a single profession, better understood and better appreciated by the people of America and more highly prized by those who compose it.

The representation of the profession at the dais was suggestive of the eventfulness of the occasion. Among those seated at the speakers platform were the President or Secretary of the Engineering Institute of Canada, the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Institute of Chemical Engineers, the American Institute of Mining and Metallurgical Engineers, the National Council of State Boards of Engineering Examiners, the Society for the Promotion of Engineering Education, the Engineers Council for Professional Development, four Past Presidents, the President, the Vice-President, Treasurer and Secretary of the National Society of Professional Engineers, the Presidents of the Connecticut, New Jersey, Pennsylvania and New York Societies and the General Chairman of the Convention Committee.

The speakers were particularly good and the presentations of the toastmaster excellent. The story is told in the introductory remarks and addresses which follow.

Toastmaster **Fairman:** Mr. President, Distinguished Guests, Ladies and Gentlemen:

The observance of anniversaries is a time-honored custom. In the case of individuals, birthdays are important occasions. Certain birthdays, for one reason or another, seem to have a special significance. For example, who among us did not eagerly look forward to his twenty-first? True, there may come a period in life when the female of the species is afflicted with a certain vagueness of memory as to total elapsed time but woe betide the husband who forgets the exact date. People like parties — and birthdays, whether your own or the other fellow's, furnish a good excuse to have one.

In the case of organizations, I suppose the conventional annual meeting is in some measure a birthday party but the fact is frequently overlooked in the press of business and only at longer intervals do we lay any particular emphasis on the observance of the anniversary as such. Tonight we are gathered to celebrate such an occasion, the tenth birthday of the National Society of Professional Engineers and the party is being sponsored by the four state societies which, ten years ago, brought the national society into being. These societies are represented at this table by their presidents . . .

In its ten years, the National Society has had eight presidents. Four of the past presidents are here tonight. To the devoted service of these men in the difficult years, the growth and strength of the society is largely due. To them, this anniversary must be of particular significance.

* * *

On special occasions, such as this, it is customary to invite to a birthday party relatives outside the intimate family circle, whom we may not see as often as we should like. We are honored to have the officers of so many national engineering organizations with us and we hope their presence is indicative of their increasing realization that the lusty infant N.S.P.E. is coming of age . . . To all those present on this auspicious occasion, may I extend in behalf of the National Society of Professional Engineers a word of appreciation and a cordial welcome.

The Chairman then proceeded to introduce the speakers. The introductory remarks and the addresses follow on succeeding pages.

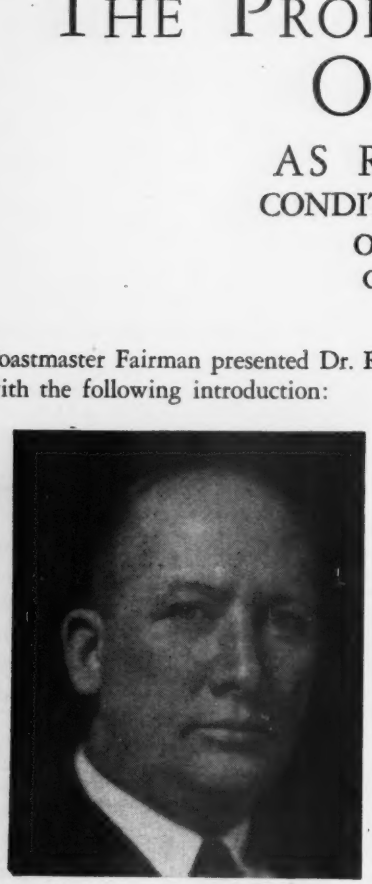
THE PROFESSIONAL DEVELOPMENT OF THE ENGINEER

AS RELATED TO EDUCATION

CONDITIONS CALLING FOR REORIENTATION OF FORMAL METHODS OF TRAINING CHALLENGE ENGINEER AND EDUCATOR

BY DR. HARRY S. ROGERS

Toastmaster Fairman presented Dr. Rogers to the audience with the following introduction:



DR. HARRY S. ROGERS
President
Society For The
Promotion of Engineering Education

A common criticism of our educators is that they have too much theory and too little practice. It may be true that a happy blending of the academic with practical working experience is not as universal as could be desired. But that charge cannot be made in the case of a young man who worked on railroad construction jobs before entering the University of Wyoming, who spent his vacations on irrigation, railroad, and municipal projects, who after graduation worked on railroad valuation, who quit that to teach engineering at the Universities of Iowa and Wyoming and Lafayette College, who thereafter dealt with building design and construction, then again taught engineering at Oregon State College, becoming the Dean of Engineering and Director of the Engineering Experiment Station — carrying on the while a consulting engineer's practice in water supply, sewerage and hydraulic power and who finally wound up as president of one of our great eastern engineering schools, the Polytechnic Institute of Brooklyn. Sandwich in all that, active participation in civic affairs and a stretch on the wartime rubber job in Washington, and it seems to me you have a well-balanced career, admirably combining theory and practice. That, briefly, has been the career of our first speaker, who appears here tonight in one of his many extra-curricular guises, that of president of the Society for the Promotion of Engineering Education, Dr. Harry S. Rogers, who will discuss "The Professional Development of the Engineer as related to Education." Dr. ROGERS.

THE PROFESSIONAL DEVELOPMENT OF THE ENGINEER AS RELATED TO EDUCATION—

Like other programs of professional education, those of engineering education are designed distinctively to prepare young men for careers of leadership in the respective fields of their choice and to disseminate and to advance the knowledge related to these fields. Because it is believed that engineering is one of the highest forms of professional enterprise, that engineers should be prepared for industrial and professional leadership, and also should take active and constructive leadership in public affairs, programs of engineering education are designed to introduce students to those fields of general economic knowledge related to management, to those social studies which will enable them intelligently to cooperate in society, to those collateral fields which enrich personal life, and to those ideals and obligations which motivate the profession.

In a review of the current situation in engineering education, it is well to examine critically the viewpoints, experience and developments in those areas of education dealing with the scientific and engineering matters, with humanistic and social matters, and with professional ideals.

Scientific-Technological Area

It would appear the scientific-technological areas of our undergraduate curricula are more or less standardized as a result of their emphasis upon the unchanging principles of engineering science rather than upon the changing standards of engineering practice. The accreditation of such curricula by the ECPD is furthermore a force toward standardization. As a whole this part of the engineering college program has proven its merits not only prior to the War but during the war-time experience. In general, those men who were available for industry through deferment or in temporary employment before enlistment in military forces were given a higher level of responsibility as they entered industry than under normal conditions they would have received and in the main they have discharged that responsibility in a creditable manner. The experience with the ASTP demonstrated to the conviction of most educators that the amount of time spent in this aspect of engineering training could be reduced only at great hazard to an adequate mastery of the principles and to the development of satisfactory competency in their use.

The progress of new applications during the War however, will undoubtedly influence certain of the engineering curricula. The developments in radar, for example, have placed an emphasis upon electronics which is perhaps the most important single development related to any curriculum. Those institutions that expect to give a general training in electrical engineering will, in the future, be compelled to emphasize electronics along with power and communications or set up separate curricula for the optional choice of the undergraduate. The rapid development of servo-mechanisms will also find some reflection in both the electrical and mechanical curricula.

While no other area seems to be affected to the same de-

gree, it is certain that high pressures, high temperatures, high speeds, and the high polymers of chemistry will require a stronger foundation in mathematics and science and a revision of the senior level courses for the presentation of problems from the field of newer applications. With perhaps the expectation of electronic advances all developments will undoubtedly be incorporated in curricula through a gradual process of evolution rather than through any general reconstruction.

Graduate Study

Perhaps the field of engineering education which will be influenced most by war experience is that beyond the undergraduate program in the graduate and post-collegiate years. The expansion of research and the development of new techniques particularly in chemical, electrical and aeronautical engineering have surpassed any experience in history. While much of the development has been in fields of application rather than in basic theory, the technology involved has been upon such a high level that graduate work is becoming increasingly more necessary and special in-service courses for engineers in industry more desirable. These developments will bring more formal course reorganizations into the programs at the master's level and will stimulate the expansion of work of a more fundamental nature at the doctoral level.

One of the most signficant developments in engineering education in recent years has occurred in the field of graduate evening study. Where strong programs have been offered in industrial areas, registration has grown by leaps and bounds. Experience at Polytechnic Institute indicates that we may expect a rapid development in the field of graduate evening study in such areas. This year our graduate enrollment will exceed 870 students and despite the impact of selective service our graduate registrations have increased each year throughout the War. With the present short work week, ample time is afforded for able and energetic engineers to pursue their technical training to the highest levels where the necessary courses are available.

Research

There has been a school of thought among some industrialists that held engineering colleges were not situated or prepared successfully to pursue research in any but the abstract fields of scientific knowledge. Experience in war-time has, however, demonstrated that many institutions have the personnel and facilities to make substantial, even great, contributions to the development of new instruments of warfare. The achievements which have been made are reason for a growing confidence in the resourcefulness of engineering schools which should encourage greater cooperation between industry and the schools in the post-war period.

The competition of free industry with its proprietary interests in secret know-how and in patent rights introduces certain obstacles to any general cooperation between industry and the colleges in the fields of *developmental* research. Most college charters will not permit such specific services to individual enterprise, and expansion in such fields would divert college interests from their major problem. Industry, however, has many basic and fundamental problems which demand solution and which do not lead to patent developments or to confidential know-how. The recognition of such needs is rapidly growing and industry is more fully appreciative of the opportunities for their solution in the detached atmosphere of the college laboratory.

The conflict between the proprietary interests of industry and the purposes of tax supported and tax exempt institutions, which require their services to be given in the public interest, has been materially modified by the development of research foundations and engineering research corporations. These have undertaken development research under broader charters and through such organizations we may expect substantial and significant developments in diversified fields.

The large amount of government research which has been assigned to some institutions has provided an opportunity to test the abilities of their staffs in productive achievement. Many of them have discovered that some of their people who possess great capacity for individual achievement lack the leadership for the organized research of groups. On the other hand, many individuals have developed far beyond their expectations. The opportunities given for the testing of personnel have provided information which will make future developments much more certain and productive. Industry will be negligent if it does not utilize these tested resources.

Humanistic-Social Area

When one turns to the humanistic-social area it is more realistic to consider the influence and experiences of the War through differentiated fields rather than as a whole. In this differentiation industrial economics, history and citizenship, and literature and other cultural courses should be considered separately. The part that engineers have played or perhaps it might be said have not played in the broad planning of industry and in the operations of governmental control agencies has been disappointing to many in the profession. The reason for this is clearly evident, however, for few engineers had a broad and detailed knowledge of American industry or the critical understanding of economics to take large leadership in governmental planning. This may or may not be considered a weakness as one judges the importance of relative emphases in the engineering curriculum and in engineering occupations.

It will be recognized that the directors of large industrial enterprise must have not only knowledge of engineering and management, but also knowledge of finance and of corporate and business law, as well as of selling and marketing. On the other hand, consulting engineers and directors of government departments and bureaus, that bear a somewhat separate and functional relationship to the services and divisions of finance and law, do not require so intimate a knowledge of these fields. In the field of industrial management a knowledge of economics, of finance and of corporate structure assumes, therefore, a more important place than in the fields of consulting or in public works.

It would seem reasonable to conclude, however, that an

understanding of industrial history and of the influence of science and engineering and its course of development and also of the elements of industrial economics should be part of the engineer's preparation if he is to have a long time forward look to the attainment of large administrative responsibility.

Such an understanding is listed among the objectives of the humanistic social division of the Report of the 1940 Committee on Aims and Scope of Engineering Curricula. At the present time the materials and teachers are not available for adequate presentation of these subjects. Many institutions recognize the need, however, and some are beginning to experiment in this area. If such weaknesses are overcome, the presentation of industrial history and of economics will have to be more closely related to studies of the influence of science and to problems illustrating the application of economic principles in industrial development and in public works.

As we consider the field of citizenship, there is no reason for segregating engineers from the general run of college students. The New York Times recently conducted a survey of the teaching of history in our colleges which disclosed that many of them did not require it and brought general expressions of consternation from influential citizens. Strangely enough, however, on one associated with the study or commenting upon it recognized the fact that in institutions where young communist groups are most active, it is the young communists who have the greater knowledge of the facts of American history. The memorization of such facts does not necessarily lead to a conviction that the democratic system is superior to or more durable than others, nor does it cultivate the attitudes and points of view essential to the support of the democratic system.

The colleges as a group have been so imbued with the doctrines of freedom in education they have assumed undergraduate students would discover the truth and appraise the virtues of democracy through a mere study of historical facts. The short duration of the college period, however, is not adequate nor are the motives always present for such a discovery. We would do well, therefore, seriously to consider a program for citizenship that is focused upon indoctrination in those beliefs for the support of which we are sending millions of our boys to fight in foreign lands. The American Society of Mechanical Engineers has a distinguished committee on citizenship which is presently working to define the particular responsibilities of engineers to their communities and country.

In those fields which may be classed as strictly cultural and the object of which is primarily to foster broad and balanced thinking and living, time seems to be sharply limited by competing pressures. Nevertheless, in a test given to college students in the State of Pennsylvania, the engineers came off first, as best informed in matters of general cultural interest. The future of the engineer as a broadly cultured citizen lies not alone in the hands of the colleges but must under the circumstances be in large part his own responsibility in post-collegiate years.

The National Council of Teachers of English has recently organized a committee for the purpose of improving and advancing education in the field of cultural relations for all professional students, as well as for those pursuing liberal education and the Society for the Promotion of Engineering Education has recently organized a Division of Humanistic-Social Studies for the purpose of developing and improving the education of engineers in the humanities and in socio-economic fields.

Functional Curricula

The great need of industry expanding under war production for men who, together with a mastery of the principles of engineering and the ability constructively to apply them, possess also a knowledge of materials, plant layout, manufacturing processes, mass production methods and controls has brought the functional fields of operation and management into bolder relief as a challenge to engineering education. Some of the practices and the techniques of mass production are amenable to classroom and laboratory instruction; some practices and techniques are not. The problem of developing programs of training for managerial and administrative responsibilities are complicated, furthermore, by the relative importance of *technical knowledge* related to materials, power, machine processes, production controls, labor operations and costs on the one hand and of *judgment* in the application of such knowledge to specific processing problems, as well as *judgment* in the organization, direction and leadership of men. The material and mechanical elements which can be presented in the classroom and laboratory are limited to an elemental nature and certainly no classroom or laboratory can provide much opportunity for developing judgment in planning, organization and administration. Nevertheless it appears that in the future industry will be looking for a larger percentage of men qualified by training and ability to assume positions of superintendence and administration.

The industrial method of selecting leaders is to pick them from the avenues of experience. While industry and the vocational schools have been conducting courses in foremanship training for a number of years, effective programs in the training of management have been limited pretty largely to a few graduate schools of business administration with little or no emphasis upon industrial management. Recently, The General Electric Company has undertaken an experiment in management education for those in supervisory positions. The techniques used are not dissimilar from those used in foremanship training. It may be expected that the results will be significant and serve as a guide to other industries. It would seem probable that the results of in-service programs of this nature would be more effective than any programs which could be presented to men without industrial or managerial experience in the academic classroom.

Indoctrination in Professional Ideals

The growing consciousness of unity among engineers as a functional group in society has awakened them to an appraisal of their social obligations and ideals. The Engineers' Council for Professional Development and its constituent members are now making a study of those in-

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THE ENGINEERING PROFESSION

IN THE DOMINION OF CANADA

AN OUTLINE OF ITS DEVELOPMENT

REGISTRATION WHICH BEGAN IN 1896

ADMINISTERED BY PROFESSIONAL ASSOCIATIONS

WHICH LOOK HOPEFULLY TOWARD TOMORROW

BY PRESIDENT de GASPE BEAUBEIN, E.I.C.

In presenting the President of the Engineering Institute of Canada, the Toastmaster stated that:

de GASPE BEAUBEIN
President
Engineering Institute of Canada

The next speaker is a friend and neighbor from north of the border. Born in Quebec of an eminent Canadian family, originally of Norman blood, he looked around at the mountains, lakes, and rivers of his native land and said to himself: "We'll have to do something about this." So he became a hydroelectric engineer. Graduating from McGill, he came to Westinghouse at East Pittsburgh to get a slant on some phases of our practice. Then he went back home to turn his vision into reality and has since devoted a large part of a distinguished career to putting nature to work. He has numbered among his clients municipalities and the Province of Quebec, as well as the great power development companies. Keenly interested in civic and professional affairs, he has given generously of his time and talents in those fields and inevitably is now participating in numerous war activities.

It is my privilege and pleasure to present to you Mr. de Gaspe Beaubein, president of the Engineering Institute of Canada, whose subject is "The Professional Movement among Engineers." Mr. BEAUBEIN.

THE ENGINEERING PROFESSION IN CANADA

May I express my appreciation of your courtesy to The Engineering Profession in my country, which, for the moment, I have the honour to represent, in asking me to address you. It is an expression of goodwill which I shall not fail to bring to the attention of the members of The Engineering Institute of Canada.

It has been my fortune, since the spring, to travel throughout Canada and visit the branches of The Engineering Institute of Canada and the universities. I am now just returning from the West where it has been my additional privilege to have a fleeting glimpse at your Pacific Coast.

This sort of inventory-taking of the profession in Canada happily shows that we have a profession with high ideals and high professional spirit. The works and the industries which I was graciously given the opportunity to see in your country give me the conviction that the vision and the ability of your engineers must have been accompanied by the highest ideals to make such achievements possible.

Let me tell you, however, that my knowledge of your profession in the United States is only sufficient to inspire me with great admiration and is very much too limited for me to speak of it. Anything I may say, therefore, applies only to the profession in Canada.

When I received your invitation sometime ago, I welcomed the opportunity to be with you. By your invitation to a Canadian, you have shown that you have a desire of promoting good international relations; my acceptance is evidence that we have the same sentiments. I think the engineers, in particular, have unusual opportunities and obligations in this field.

I cannot help but feel that engineering itself is of an international character. The great engineering problems and opportunities that go with our waterways do not recognize any international boundary. The water that flows in our international rivers and lakes pays no attention to customs or immigration regulations and to some extent at least the engineering problems that go with these bodies of water are also beyond the limitations of national borders.

We have rivers that have their source in one country and then travel into the other. In some instances they even go back and forth. We have the Great Lakes and St. Lawrence River Waterway — the greatest fresh-water body in existence. They form a beautiful and satisfactory boundary line. How useful and how conducive to goodwill to have these great bodies of water shared equally, without restraint, by both nations. The overlapping and intertwining of interest is good for us all.

International "complications" of the kind to which I have referred afford us splendid opportunities to know each other better, and in wrestling with the common problem we find common ground in many other things.

In Canada we accuse ourselves of following the United States in almost everything and of copying your very good example. I suppose this is a logical development when a small nation is adjacent to a large and more populous one. It is true that we do many things as you do and that we get many of our ideas from your country.

For instance, we read mostly American magazines, although there is no necessity for it because our own are

just as bad! We read mostly news that comes from the United States. We hear mostly American radio programmes. It is natural, therefore, that we are greatly influenced in Canada by what you do in the United States. We find we are even modifying our English vocabulary to agree with yours, although we do make strong efforts to resist at times. But, in spite of all the things we do the same, and of all the Amercian practices with which we are familiar, we still exhibit some originality. We still struggle to maintain some character of our own.

Perhaps it is because we were in the war before you were, or perhaps it is just due to our innate stubborness, that in a great many of our war activities we have established practices and customs different from yours. For instance, our systems of price and wage control are different. Our systems of national mobilization have marked differences. Of course you have heard something of our conscription troubles in Canada, and while we would prefer that our own discussions on these domestic affairs be not too widely circulated, the fact remains that Canada has overseas a higher percentage of its population than has your own good country — so judge us not too hastily.

War Time Education

Coming down to subjects of more specific interest to this audience, we find that throughout the war we have handled the matter of engineering education on a different basis. We have endeavored *to encourage* young men to go to engineering universities, and we have *guaranteed* that they would not be called up for the armed services as long as they met the rigid requirements that have been established. We have felt that we should not interfere with the natural flow in the development of engineers for the present and the future.

In spite of the criticism that could be foreseen for the setting up of a "privileged class," the authorities went ahead because they felt that engineers were going to be one of the scarcest of essential commodities and that they should be produced in an even greater quantity. Special funds were established to pay university costs as an inducement for those who had the qualifications but not the money. Letters were sent to universities from the Department of National Defense requesting that all students enrolled in engineering be urged to stay with their courses rather than go active. In this way our annual production of engineers has been maintained. This policy has been a great aid to our war effort and will be an equally great aid to our peacetime effort.

We have developed different methods of controlling our manpower in Canada. Through the medium of the Wartime Bureau of Technical Personnel we have kept a strong hand on the moves and the employment of our engineers and other technical personnel. No employer may engage a technical person without a permit from the Bureau. In this way we have been able to allocate the technical personnel to those industries and occupations that have the highest priority.

This Bureau is operated by the Engineering Institute of Canada, the Canadian Institute of Mining and Metallurgy, and the Chemical Institute of Canada, although the entire cost is borne by the federal Department of Labour. It is quite unique in Canadian affairs and I have not heard of any setup just like it elsewhere, although in Great Britain they have a similar procedure operated directly by the Ministry of Labour. We have been well satisfied with the results obtained.

Registration In Canada

Coming from the more general to the more specific, we have developed in Canada a system of registration for professional engineers substantially different from yours. I am not attempting in this, any more than I attempted in the previous examples, to suggest that our method is any better than yours. I am simply making the observation that in spite of our close neighborliness and our inclination to copy everything you do, we have still maintained these differences.

May I explain to you that the Engineering Institute of Canada represents all types of engineers and all branches of engineering. It was established in 1887 as the Canadian Society of Civil Engineers, the word "Civil" at that time meaning all classes of engineers other than military. The name was changed to its present form in 1918. Under these circumstances, it is natural, and we encourage it, that many of our members seek specialized information from the Founder Societies and to those Societies we acknowledge our indebtedness for inspiration and assistance. I am particularly happy to have this opportunity to make public reference, in your country, to the cooperation they have given us.

In Canada, the movement towards registration of engineers began about 1896. At that time Professional Engineers' Acts were passed in Manitoba and in Quebec. These acts limited the practice of engineering to the members of the Canadian Society of Civil Engineers resident in Canada, but they were not workable and eventually were superceded by other legislation.

In 1919 The Engineering Institute established a committee to draw up a model act for submission to the various provincial legislatures. This act has been the basis of all subsequent developments. I dwell on this point because I want you to understand that The Engineering Institute, which, ever since its formation has been the largest and I believe beyond doubt the leading technical society in Canada, was the parent of the registration movement. The Institute itself could not administer the legislation due to the fact that the control of matters of his kind were provincial rather than federal, as is the case in your country.

Today, in all provinces except Prince Edward Island, there is a professional engineers' association which is charged with administering the Professional Engineers' Act for the province. Since their formation these associations have gone their own free and independent way. One great difference between our system and yours is that the engineers themselves administer the act. Each person who is registered becomes a member of the provincial Association. He is not licenced by the province or the state, but by the Association itself. In this way the profession has entire control of the regulations which apply to it.

I need hardly tell an audience of this kind that all these

development did not take place without some difficulties. Actually many years elapsed between the approval of the Model Act and the passing of an act in the last province. There is a long and interesting story to be told between these two dates, but I imagine it follows very closely the story of your own development in this country.

Engineering Organization in Canada

Another interesting feature of our situation in Canada is the relationship that still exists between The Engineering Institute and the Provincial Professional organizations. Some time ago, a form of agreement was devised whereby in each province cooperation between The Institute and the Association could be expanded on the basis which is in the best interests of the profession.

So far agreements of this type has been signed with four provincial organizations out of the eight. A successful ballot has been taken in a fifth, and a ballot is now being canvassed in the sixth. These agreements are arranged in each province between the members of The Institute in that province and the members of the provincial Association. The principal provision of the agreement is that it provides for a common membership. Special facilities are afforded the members of each organization for joining the other. For instance, such things as entrance and transfer fees are abolished, and the single annual fee for the two memberships is substantially less than the sum of the two separate fees. All meetings except the meetings required for legal purposes are joint meetings.

In some instances, the officers of the Professional Association are identical with the officers of The Institute branch. I have sat in at committee meetings where in the first part of the day the chairman of the meeting was the chairman of the branch of The Institute and the members of his committee were the members of the executive of the Institute branch. After the completion of The Institute business, that meeting was declared adjourned, and the same chairman called the meeting of the council of the Professional Association. In this instance he presided as president of the Association, and each member around the table became a councillor of the Association. I cannot help but feel that this is cooperation well beyond the experimental stage.

Another feature which I feel will go a long way towards promoting cooperation right across Canada is that each Association that has an agreement with the Institute has the right to name one of its own members to sit on the council of The Institute at all meetings of that governing body. In this way the council of the Institute is being built into a representative cooperative body whose decisions on policy are made only after consideration of the welfare of the Associations as well as of The Institute.

It is impossible to tell what the ultimate development will be, but all of us see in these trends a consolidation of the profession and a unification that will permit the group to work more efficiently in conducting its own affairs and more effectively in all affairs where the public is concerned.

I would not have you think that in Canada we have reached the ultimate in these matters. While we have probably gone a long way towards the goal, the fact remains we still have our little troubles here and there. At times we are inclined to exaggerate these, as perhaps you are in the United States. But when I examine today's position and compare it with that which existed twenty years ago, I am astounded by what has been accomplished. If the next twenty years see us make as much advancement we should be very well pleased indeed. Perhaps by that time we can say that we have *real* cooperation between enginering societies and that at the same time we have the necessary protection for the public.

Cooperation Within The Profession

One of the most potent words in the English language is "cooperation". There is almost nothing that cannor be accomplished with it, and almost nothing that can be accomplished without it. We engineers have succeeded in building up, or perhaps I should say have watched the growing up of an extremely complicated arrangement as far as our societies are concerned. I have been given figures for the number of different professional technical organizations in your country, but I hesitate to repeat them, because they sound so fantastic. But on the other hand, I suppose we are just about as bad in Canada. Another disturbing element is that although many of us are concerned with promoting cooperation between existing organizations, at the same time other organizations are coming into the field which multiply so fast that I sometimes wonder if our cooperative endeavours will ever catch up with the needs. It is easy to become discouraged in such matters, but I feel that we senior engineers have a great responsibility to the profession to keep everlastingly at this subject. We shall never attain the maximum heights for our profession or for ourselves as individuals until we have established a wholesome cooperation throughout the land. In my mind, cooperation is more a spirit or an outlook than anything else. The mere signing of agreements or the setting up of new organizations will not provide it of themselves. If we get cooperation in our hearts, we will have it in our lives — not otherwise!

Our profession has come a long way but I believe we are only at the beginning. The future holds more for us than I dare contemplate. Our contribution to the welfare of this great nation, my great nation, and the other great nations, will be proportional to the levels which we are able to establish within the minds and the morals of those who come after us.

I cannot help but think that one of the most important steps in the long upward climb to professional recognition and public service is the one labeled "cooperation." If in our time we can reach that step, we will have left something worthwhile for those who follow after.

We are now faced with war legislation somewhat akin to your Wagner Act, under which the engineer finds himself subject to the control of the labour bargaining agency that may exist in an industry. All engineering organizations have cooperated to meet this situation. A canvas of all memberships gave a firm mandate to secure separate legislation that will provide collective bargaining for *engineers by engineers*. For the moment, exclusion from

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ROLE OF THE ENGINEER IN THIS WAR

TECHNOLOGY MORE VITAL TO SUCCESS THAN ORTHODOX TACTICS AND STRATEGY

NATIONAL DEFENSE CALLS FOR ENGINEERS TO SHARE AUTHORITY WITH MILITARY EXPERTS

By MAJOR ALEXANDER de SEVERSKY

Introducing Major de Seversky, world renowned aeronautical engineer and scientist, Chairman Fairman offered the appended brief commentary of the speaker's accomplishments.

If the final speaker should put down his paper after reading today's news of the air war and ***say "well, I told you so,"*** *we could answer "Major, you certainly did."*

He is a prophet, yet unlike most prophets it cannot be said of him that he is not without honor save in his own country. He has been acclaimed by the whole world. He has been honored by such diverse personalities as the Czar of All the Russias and the President of the United States. Perhaps, I had better modify that "whole world." I'm certain our present enemies don't like him. But you can be sure they have a healthy respect for him and his ideas.

Let's look at today's war news. "Giant bombers, from great heights, protected by fighters, drop explosives with uncanny precision on foe's industrial heart." This man invented the supercharger that makes it possible for planes to fly at great heights. He pounded a great many official desks in advocacy of the long-range fighter. He invented the first automatic bombsight so that a boy of twenty can twirl a few knobs and drop ten tons of high explosives exactly where it will do US the most good.

He has designed so many different types of planes and so many kinds of plane apparatus and equipment that it may fairly be said of him that no man now living has contributed more to the development of aircraft. And not only has he designed and built planes, he has flown them—in actual combat, as a test pilot and just for the sheer fun of breaking records.

With such a background, he can speak with full authority on ***"The Role of The Engineer in This War."***

I have the honor to present that warrior, engineer, author, and citizen of the world—that dreamer who produces the blue prints ***and the finished product—Major ALEXANDER de SEVERSKY.***

Mr. Toastmaster, distinguished guests, ladies, fellow Engineers

It makes me very happy indeed to have this opportunity to address an audience which speaks the same language as I do, though with a much better accent. It gives me the opportunity to let my hair down—to get off my chest some of the things that have bothered me for some time—without any fear of being misunderstood or misinterpreted.

Never in the history of human conflict has the outcome of a war depended so crucially on the contribution made by the professional engineer. Indeed, this is truly a technological war. Without detracting anything from the glory and credit due our gallant fighting men on the battle fronts, it is fair to say that the defeat of the enemy in the final analysis will be largely decided by the slide rule of the American engineer.

Men of science are used to struggle. We are used to fighting on two fronts at the same time. One is the fight to overcome technological barriers in order that science may triumph over nature. The other is the fight to overcome the fear of change, deep-rooted habit, and the orthodoxy of the common man. I wouldn't be far wrong in estimating that the average engineer spends only 20 per cent of his time solving technological problems, and 80 per cent of his time convincing his fellow men of the logic of his solutions.

In time of peace, financial considerations and business policy very often retard research and development, and preclude free engineering changes. In time of war, financial obstacles disappear, but engineering research is confined to an even more narrow path of development—the path dictated by decisions on military strategy. All too often, inventions and discoveries which might have changed the whole course of war are not only overlooked but even tabooed because they do not coincide with the prevailing military view. That condition is not new with our generation. It is as old as human conflict itself. It happened in the days of bows and arrows, ramrods, cannon balls, sailing vessels and ironclads.

The reason for this was brilliantly expressed by Admiral Mahan, dean of American Naval strategy, who said back in 1886, and I quote: "Changes of tactics have not only taken place *after* changes in weapons, which necessarily is the case, but the interval between such changes has been unduly long. This doubtless arises from the fact that an improvement of weapons is due to the energy of one or two men, while changes in tactics have to over-

come the inertia of a conservative class; but that is a great evil . . . History shows that it is vain to hope that military men generally will be at pains to do this, but that the one who does will go into battle with a great advantage." End of quote.

Mahan's warnings did not impress the military fraternity. In spite of the tremendous technological progreses made after World War I, we were groomed for a second conflict along good old true-and-tried methods of the 1918 vintage. We left it to the more dynamic aggressor nations to take full advantage of technological progress. We left it to them to adjust their strategy and tactics, while we remained in the rut of orthodoxy. That is why those nations went into battle with a great advantage and were able to gain enormous military success from the outset.

Our trouble in the beginning of the war was not so much that we had "too little too late." Our trouble was that whatever we did have was of the wrong kind and located in the wrong places. Particularly in our war against Japan, we were prepared to fight it out on the high seas in a traditional battle between two opposing fleets. We expected to destroy the Japanese Navy in short order on the high seas and then clamp a naval blocade on the Japanese Islands and starve them into submission. But the Japs took full advantage of recent technological progress. They had studied and learned the lessons of the war in Europe from 1939 to 1941. They struck at us in the completely novel and unsuspected method of triphibious warfare. Their land, sea and air forces were welded into an integrated team which struck at us from an unsuspected direction and chased us from one island after another until most of the Pacific was in their hands.

Finally the Japs had to stop. They had to organize their over-extended lines of communication and consolidate their newly won positions. That gave us a breathing spell, and we began to mobilize our strength. Under the impact of the first humiliating defeats, our old strategy was thrown overboard. A triphibious strategy, patterned on the successful action of the enemy, was then adopted. We proceeded to create our own triphibious task forces.

American Ingenuity and Policy

The history of warfare shows that any radical change in strategy after the beginning of hostilities is very seldom successful. But in our case a tragedy was averted by the miracle of American research, engineering and production. Once released from the straight jacket of obsolete methods of warfare, our America solved what appeared to be at the time insurmountable problems of designing, building and producing on a prodigious scale a maze of totally new weapons for a brand new type of warfare.

Working within the strict limits of a triphibious strategy, our engineers have outsmarted, outdesigned and outbuilt the enemy in every piece of equipment. This gave our fighting men a tactical edge on land, sea and in the air. From the beginning of war, we have conceived, designed, developed and produced nearly 3,000 separate major weapons, and nearly 500,000 devices, each one of them representing an ingenious solution of some difficult engineering problem.

Nowhere on the face of the earth, except in the United States, could such titanic obstacles have been surmounted. And the fact that we can successfully put in effect and support a strategy that calls for the designing, tooling and producing of astronomical amounts of variegated equipment is a profound tribute to the creative genius of the American engineer.

But gentlemen, we face a grave paradox. In this vast American enginering talent lies our strength—but also our weakness. Because we are so superior technologically to any other nation, because we are richer in our inventive talents and our speed of production, we can make *any* strategy or *any* plan of war work.

I believe that if our strategy called for fighting with bows and arrows, we would win the war eventually anyhow —again because of the ingenuity of the engineer. Confined exclusively to this primitive weapon, our engineers would no doubt endow the bows and arrows with properties and performance factors undreamed of in archery circles. The latest results of research in aerodynamics, mechanics and propulsion would be adapted to the outmoded weapon. Jet propulsion and rocket power would be utilized, making the bow and arrow the acme of perfection.

But if, in spite of all this, the enemy still retained the tactical advantage— by the use of firepower, let us say— we would still be able to defeat him by the sheer weight of our equipment. Our prodigious production facilities would come to the rescue. We would produce so many arrows that we could literally suffocate the enemy under a thick blanket of arrows many feet high, just as a mountain village is sometimes suffocated by an avalanche of snow.

Unfortunately quantity in weapons calls for corresponding quantity in men. Although superior quantity is a quality in itself, we engineers want to win this war through the efficiency and superiority of weapons, not through numbers. We want to win it with a minimum investment in human life.

I cannot share the enthusiasm of the radio commentator who, in describing the battle of Holland a few days ago, said, and I quote: "It has been officially admitted that the German Tiger tank is vastly superior in every respect to anything we have in our armed forces." He then added with great pride: "But the enemy has no chance, because we have more tanks to lose." End of quote. Millions of Americans listening to this commentator probably asked themselves the question: What's wrong with our engineers? Can't they produce a better tank? Must we match the enemy's quality with our quantity?

Nothing can be more dangerous than the loss of faith by the American people in their technological superiority. Strategies can be changed. Organizations can be revised. Individuals can be replaced. But there is no substitute for native ingenuity. It is up to us, the engineers, to uphold the confidence of the American people in our country's well-deserved reputation for technological superiority.

Why is it that we have suffered some technological setbacks? Why have we permitted the enemy nations, again and again, to get the jump on us in the matter of scientific innovations? It is our job to analyze the reasons so that

the American people understand them and do not lose confidence in America's technological superiority.

To begin with, we must analyze the true relationship between quality and quantity. As I said a few minutes ago, we entered this war with the wrong kind of weapons deployed in the wrong places. As we retreated before a superior enemy—superior both in quality and quantity—our people were disappointed and alarmed. But luckily for ourselves and mankind, our democratic system of life came to the rescue.

Press and radio shouted embarrassing questions. The average citizen, bringing to bear common sense and not hampered by congealed military traditions, supported the critics. Our fighting men from various fronts told the folks back home what was wrong with our military equipment and methods. The grip of military cliches on our engineering talent was loosened. The force of public opinion swept all barriers from its path. Military officials were obliged to revise their views and equipment. Our country's productive genius quickly came through with better weapons.

The fact, however, that we were caught by the enemy with inferior weapons has to some extent put a stigma on our engineering talent, since it was seldom explained to the American people that the word "inferior" referred to the military characteristics of these weapons and not to their engineering properties. The public should understand this all-important difference.

A horse-driven piece of artillery can be more ingenious in many respects, from a purely engineering point of view, than a self-propelled piece of artillery. The horse-driven carriage may have all the engineering intricacies of an automotive vehicle. It may even incorporate an internal combustion engine with all of its complexities or jet or rocket power in order to assist the horse in its daily work. The horse itself can be controlled by remote and radio-activated bridles, an automatic feeder of oats and water, and a mobile incinerator to dispose of the residue. The contraption could have radio transmission from the driver to the horse's ear to make sure that the horse hears the command.

Thus, in all its detail, it can be a manifestation of superb scientific ingenuity. Yet such a deluxe horse-driven vehicle may prove inferior on the field of battle to a self-propelled vehicle. The basic fault in that case would not lie with engineering but with the military decision to employ horse-driven vehicles instead of self-propelled vehicles.

Engineering and Tactics

I have purposely used a far-fetched analogy, of course, to make my point. The point is that there is a world of difference between tactical inferiority and engineering inferiority. A superb engineering product can be inferior tactically, and vice versa.

Once people grasp this essential difference, they will understand that if certain weapons were not developed in this country, it is because our plan of strategy and tactics did not call for them. They will stop wondering why, for instance, jet propulsion came from England; why rocket ammunition came from Germany and Russia; why the jet-propelled airplane first appeared in Italy; why rocket fighters are already being used by Germany; why radar-location systems were conceived by the British and first demonstrated in the Battle of Britain; why fighters with self-sealing tanks, greater speed, greater rate of climb, and heavier armor and armament were in existence in other countries at the beginning of the war, but not in the United States. I could cite the flying robot bomb and endless other examples.

As we look back at the picture of progress in weapons in this war, we must admit that at face value it justifies some pessimism on the part of the public as to our technological abilities. That is why the cause of the seeming backwardness should be thoroughly aired and explained, even if it hurts some feelings in some quarters.

Not only has there been no honest effort to explain the puzzling facts but much worse, there has been a tendency to distort the facts. Every time some other nation comes through with some new invention or weapon, any number of our public relations offices, military and commercial alike, rush to the press and radio to prove that it's "old stuff," that the original idea was developed here and was experimented with in America years before it appeared on the fighting fronts.

The only effect of such publicity is that the American people begin to suspect that we are unable to reduce those ideas or new inventions to practice. They do not know—and they should be told—that these weapons, inventions and discoveries were not developed here because they seemed impractical to our strategy-makers and were therefore considered unworthy of the investment of our funds for national defense. As a nation we have had luck on our side. In Europe we are fighting an enemy who, though our equal in science, is far below us in productive skill. And in the Pacific, we are fighting a foe inferior in every respect. Consequently, it is only a matter of time until we emerge victorious, regardless of what strategy we employ. It is only a question of how high a price we are willing to pay in life and substance.

Concerning The Future

But now we must look ahead, to the years to come. All nations agree that the next peace will have to be backed by force. And force means readiness to go to war. We must be sure that we do not repeat the mistakes of the past. We must be sure that our weapons fully answer the tactical realities of the conflict so that we do not have to sacrifice lives needlessly or squander our national resources in the process of catching up.

As time passes, human conflict will be more and more a technological problem. The science of war itself will become more and more an engineering problem. It will be a war between tremendous sources of power—war waged directly through space, over great distances, with one nation striking directly across oceans at the industrial heart of another nation. In the future, war will start immediately with the annihilation of the enemy nation's means to wage war. Air power and electronics will fight for control of the air and control of electronic space, in

order to secure freedom of action. Once this is attained, long-range electronically controlled flying torpedoes could be brought into play, adding their weight of destruction to the forces of air power in being.

In war or peace, we are entering a highly competitive technological world. Development of known forces and discovery of new power will proceed at an increased speed and with constant acceleration. Under these conditions, military leadership itself will have to become technological. Research and engineering will become the very backbone of our military strategy. We shall be in a gigantic race, intensive and without let-up.

Our backwardness in weapons at the outbreak of this war has become so obvious that, in laying plans for the future, the government and the military leaders alike are now stressing the necessity for abundant research. But no matter how great the expansion of our research, it will be of no avail until and unless we, at the same time, reorganize our military institutions in such a way that advanced engineering ideas can be immediately picked up and developed for the benefit of our security, and not shelved because they do not happen to coincide with the current military thinking.

In order to explain what I mean, let me touch once more on our technological picture immediately before the war. The idea of a robot plane was reduced to practice in our country back to 1918. Large military rockets were developed in 1921. In 1934, engineers recommended rocket ammunition for aircraft. Engineers clamored for greater fire-power and armor on our airplanes, for long-range escort fighters, for machine-gun turrets on our bombers. There was nothing wrong with our research; there was nothing wrong with the technological vigor of our engineers. Unfortunately all these developments were ignored or dismissed as visionary, impractical and irrelevant to the specifications of our military institutions.

In view of this, what guarantee do we have that in the future, even though greater appropriations are made available for research and more men are engaged, the effort will be channeled along the proper lines of development. What guarantee have we that greater boldness and audacity will be exercised by our strategy planners in order to apply the products of our engineering minds promptly and correctly for our national defense? The problem, as I see it, is not only to increase the scope of our research. To us engineers, the problem is to create a better understanding by the American people of our aims and to instil greater confidence in the engineer's professional judgment.

Upon entering the greatest technological race that has ever taken place in human history, we ought to recast our thinking so that engineering brains will receive a due share in the planning and organization of our national life. There is still a tendency to regard the engineering mind as a kind of accessory—as an instrument in the hands of "superior" executive minds. The political and business leaders use the engineer as a reference to carry out decisions and translate plans into action—but rarely do the engineers have an adequate role in shaping those decisions and formulating those plans. The unspoken assumption has been that the rational political or financial mind must keep the rather unrational creative mind in check less it run wild.

I shall never forget that some years ago a great financier, the head of a large aviation outfit, jokingly but with underlying seriousness, expressed the opinion that engineers should be confined in cages and fed peanuts while business men passed judgment on the validity of those engineers' creations. Unfortunately this opinion still persists in many high places. Such an attitude provides one good explanation why the United States, the greatest technological country in the world, found itself with backward military equipment at the outset of the war. With the best will in the world, leaders who lacked the appropriate technical knowledge and scientific vision could not plan adequately for the future.

As we enter the new technological world, scientific progress will be so vast in every department of life, changes will be so rapid, that lay leadership will not be enough. National leadership must be reinforced by drawing upon engineering brains, if it is to anticipate technological revolutions and prepare to meet the impact of new facts, in peace and in war alike.

Technology The Weapon Of War

Henceforth, I am convinced, no statesman or military leader can fulfill his role unless he has technological foresight along with his professional knowledge. He does not necessarily have to be an engineer by education and experience. But he certainly must have the inborn ability to understand the technological tempo, to be able to recognize technological changes, to be free from fear of change, and to have the mental and moral courage to stand up for his convictions. These are absolutely essential qualities of future public leaders.

The relationship between society and the engineer will tend to be reversed. Businessmen and military leaders will no longer exercise their skill and influence to suppress the impulses of the engineer, which flow from knowledge and experience, but to assist the engineer in putting them into practice. The age-old criticism of the engineer—namely that he thinks in terms of "tomorrow"—will be no more. Technologically we are moving with breathtaking speed. Before we know it, "tomorrow" will not only be "today" but "yesterday." In other words, from now on scientific progress will move not at a greater speed but at a greater rate of acceleration.

Only a little while ago, in my particular field—aeronautics—those of us who recommended rocket and jet propulsion and longer range for our air power were accused of doing a disservice to our war effort by proposing to fight this war with weapons of "tomorrow." But "tomorrow" has come; the war is still with us; and we have had to borrow new weapons from our enemy in order to be on time.

Yes, we are bombing Japan today over a distance of 1500 miles. But in order to do this, we either have to resort to a most complicated procedure of flying everything in thimblefuls over the Himelayas, using vastly more air power for transportation than for bombing, or we have to shed precious blood to win the bases close enough to

Japan from which we can reach the heart and vitals of the enemy with B-29's. But had the voice of the engineer been heeded, had the proposals of the superb designers in our aviation industry, such as Glenn Martin, Consolidated, Douglas, Lockheed and others been listened to, we might have been delivering even greater blows at Japan today directly from the bases of Australia, Alaska and India—and on a much larger scale. An infinitesimal move of the engineer's slide rule, if permitted, could have obviated the necessity of fighting for intermediary bases. This is an aeronautical example, but I know that, no matter how great the advances made, equivalent examples could have been drawn from every field of engineering—guns, rifles, tanks, radar, chemicals, medicine, everything.

The sad part of the story is that ultimately, before this war is over, every lead offered by engineers will be taken up and reduced to practice. The tragedy is precisely in this time-lag between the engineering conception and its acceptance by men of small vision and settled habits. This time-lag provided a respite to the enemy in the past and may mean victory for some enemy in the future. Because of this time-lag we must win this war with a greater quantity of weapons which, unhappily, also means a greater sacrifice of precious lives.

That is why I believe that, from this time forward, strategy for national defense should no longer be exclusively the province of military men. War has become too complicated. Today it is a science involving the highest degree of engineering. If the Board of National Security being suggested by certain of our legislators should be created, one of its principal problems will be to prevent the subordination of engineering minds to military thought. The engineer and the military strategist in the world of tomorrow must work together as equals, because new weapons, new technological principles, open up new potentials in tactics and strategy. By the same token, a special national policy or strategic aim may require the development of special weapons.

In short, as time passes the influence of the engineer on national defense and security will inevitably be more profound and, unless the engineer shares final authority with the military in the formulation of our strategy, we can invest billions of dollars in research and get nowhere. In that case, indeed, the great investment may only serve to perpetuate outmoded methods and to encourage a false sense of security. To illustrate my point, we need only look back to the time just before the war when we were pouring our national resources into orthodox cavalry and obsolete coast fortifications to appreciate the anachronistic state of affairs. It was Clemenceau, French Prime Minister of War during World War I, who said that war is too serious a business to be entrusted entirely to military minds. We in America owe a debt of gratitude to our system of government in which our Commander In Chief, Secretaries and Under Secretaries of our military institutions are civilians.

Future Responsibility of the Engineer

And now in conclusion, I would like to say a few words about the future. After this war, the world will find itself by and large in ruins. It will be eager to reconstruct itself. But the enormous destruction wrought by this war will be, in some respects, a blessing in disguise. The inertia of habit in our living—in communications, transportation, manufacture, and other branches—will be swept away with the debris of yesterday's civilization. The world will clamor for better things—more efficient and comfortable things—to make life more worth while. Paradoxically, the nations that suffer most in this war may emerge with more advanced standards of living, because in adopting new things they will not have the competition of existing things.

As we emerge from the chaos and horror of the war, the engineer will have to show the way in hewing a path to a better world. He, more than anyone else, will be able to apply the powers of science to removing the ruins and erecting a new structure in their stead.

The global war has given science an enormous new impetus. It has been said endless times but it is true that decades of technical progress have been telescoped into a few years. But the marvels of wartime aviation, electronics, rocketry, engineering, chemistry are only indications of the many marvels incubating in research laboratories. The time is not far off when the nations of the world will hold in their hands scientific force which will be capable of blowing all civiliation to bits. Not only the engineer, but even the layman, takes it for granted that the next war will be more terrible than the present one.

This has been true all through history. Prophecies of destruction have been made in the past, but never before have they been so ominous. We who have devoted our life to science know that the next war will bring more destruction than this one, and it will be destruction of a new kind, on an unprecedented scale, and against every living thing on earth. In the wars of the immediate future entire populations will be directly menaced by instruments of demolition more effective than any now in existence. The destricutive power of electronics, the latent resources of modern chemistry, the efficiency of aerodynamics and mechanics have scarcely been tapped. Within a decade or less they will be ready to visit horror on men in new and unimagined forms. War will become a gigantic clash of highly technological monsters attacking from the heart of one nation directly to the heart of another—perhaps halfway around the world—with fury and destruction that will make all past conflicts, including World War II, seem trivial by contrast.

Humanity today is like a child playing with matches. It has the ability to ignite them, but lacks a sense of danger or the self-control to desist. Technology, of course is not to blame, because every one of the weapons of death and destruction is potentially a *constructive* force. But since we engineers are the creators of these scientific forces, the time has arrived when we as a group—in giving the product of our technological effort to the people—must also impart to them a sense of moral responsibility in the use of these new potential forces.

These terrific new forces, if they are properly harnessed and used, will be the greatest blessing of mankind. If

(Continued on Page 28)

Submitted as:

ITEMS OF GENERAL INTEREST

Collective Bargaining and Engineering

From Mining and Metallurgy — December 1944

Of interest is the following editorial prepared by Secretary Parsons of the American Institute of Mining and Metallurgical Engineers:

A frequent cause for confusion in considering collective bargaining in relation to members of professional engineering societies is the failure to distinguish between (1) the actual occupation of an individual and (2) the occupation that he may have set as his objective when he went to an engineering school or that he might even be competent to perform if he could get the chance. The Fair Labor Standards Act and related legislation deals personally with classes of jobs, not with qualifications of individuals. For example, if either Tom Girdler or Charles F. Kettering were to go to work as a lathe operator in a machine shop he would cease to be an executive or a professional employee and would be eligible—indeed would be obliged—to join the Machinists Union. A great many men who have graduated from engineering schools and colleges are engaged in work that is neither professional, executive, nor administrative, according to the definitions recommended by the Wage and Hour Division of the U. S. Department of Labor. The following condensed versions of these definitions are interesting.

"Executive" employee—primary duty consists of the management of the establishment where he is employed . . . customarily directs the work of other employees . . . has authority to hire or fire other employees or whose recommendations are given particular weight . . . customarily exercises discretionary power.

"Administrative" employee—regularly and directly assists an "executive" employee, such assistance being nonmanual in nature and requiring exercise of discretion and independent judgment . . . performs such nonmanual duties with only general supervision and along lines requiring special training, experience, and knowledge.

"Professional" employee—engaged in work predominantly intellectual and varied as opposed to routine, mental, manual, mechanical, or physical work . . . requiring the consistent exercise of discretion and judgment . . . of such character that the output cannot be standardized in relation to a given period of time . . . requiring knowledge of an advanced type in a field of science or learning customarily acquired by a prolonged course of specialized intellectual instruction and study.

Probably 98 per cent of the active members of recognized national engineering societies are employees in the sense that they are paid salaries by some corporation, governmental agency, or other employer. However, a substantial proportion of members ranging, possibly, from 25 percent to 75 per cent in the various societies are exempt from the collective bargaining provisions of the law because they are employed in bona fide executive, administrative, or professional capacities. Perhaps the reason for the insistent demand among its members that the American Society of Civil Engineers foster and guide collective bargaining activities is that so many of its members, even those of mature age, work as surveyors, or draftsmen, or in other capacities that do not put them in the exempt categories. Even so, unless the Am. Soc. C. E. is prepared to expel a substantial part of its membership, including most of its leaders, neither it nor any of its Local Sections can, as an organization, become a collective bargaining group or unit under the terms of existing statutes. It can, however, provide advice and counsel to its members as to the organization and operation of local unions of professional engineers; and this it is now doing. To date the other societies have studiously refrained from taking similar steps. The policy of the A. I. M. E. at present is set forth as follows:

The Institute does not regard the sponsoring or fostering of "collective bargaining units" (unions) among its members as being one of its proper functions. The union is based on collectivism and regimentation as distinguished from individuality and liberty of action. A union does not afford the intellectual "climate" in which a professional man can flourish. At the same time the A. I. M. E. does not regard membership in the union as in any sense reprehensible; and if a young engineer finds himself in a position where membership in a union is required for him to hold or obtain a desirable position, there is no valid reason why he should not become a member of the union. His membership in a union, however, is a matter entirely separate and distinct from membership in his profession, and consequently is outside the province of his professional society.

Why Did You Join?

Berry E. Brevik

Membership in a Society of Professional Engineers must have meant something to you—else why did you join? Surely, if it was worthwhile joining it should be worth supporting, not only by the prompt payment of the annual dues but by your activity on a committee and by influencing eligible engineers to apply for membership.

If the Society is to become a vital force in the advancement of our profession a unified effort is essential. This means that the Society requires the support of all Professional Engineers, and that the Society should be manned by strong leaders.

A glance over the list of officers and committeemen now serving the Society indicates conclusively that it is being guided by well chosen leaders who are unselfishly devoting their time and energy on behalf of the Professional Engineer so that his status, socially and economically, will be improved.

The slogan "Every Member Get a Member" which appears frequently on the pages of the *Wisconsin Professional Engineer* should have a particular significance to all members of the W. S. P. E. By its very wording each member is invited to serve on the Membership Committee, and as such aid the Society by bringing in new members. (And, there is no legal limit.)

In the organizing of this committee, President Withey was fully aware of the importance of the Membership Committee and wisely formed a large committee having state-wide representation. Even though this committee has worked diligently, it has, unfortunately, been compelled to operate under the war time restrictions. This has naturally hampered its work, therefore the committee asks that 'Every Member Get a Member."

It is the opinion of the Membership Committee that the formation of local chapters will definitely be a boon to the membership, for, local chapters will tend to bring the Society to the many Professional Engineers of the State who would otherwise have little contact with the State Society and would be unfamiliar with its purpose and intent. Experience in other states indicates that local chapters are essential to the complete success of a state society.

Chapter 1 was authorized by the Board of Direction this spring when a charter was granted to members residing in the Fox River Valley area. Plans are under way for completion of the organization of this chapter. Consideration and encouragement is being given to the formation of other chapters in the State. Be-

cause the formation of local chapters is one of the functions and duties of the Membership Committee, the Committee will welcome inquiries from groups considering the organization of chapters.

Many Professional Engineers are hesitant about applying for membership. In many instances their reason for postponing affiliation is that they prefer to wait to see what the Society will do for them. They do not seem to be concerned as to what they might do to help advance the engineering profession and thereby improve their standing and that of their fellow engineers. They fail to appreciate the need for every loyal engineer joining the Society. If every engineer was inclined to wait nothing would or could be accomplished.

It is generally admitted that the public does not recognize engineering as a profession and does not place the Professional Engineer on the same plane as that of the doctor or lawyer. Who is most responsible for this situation? Unfortunately, it is the engineer. With proper support by the Professional Engineers, the W. S. P. E. will do much to correct this situation.

If every member will do his part by heeding the request that "Every Member Get a Member" the Society will grow to be a large, strong, effective organization capable of aiding the Professional Engineer in his social and economic problems.

Let every member sell himself as to the merits of the Society and realize the potentialities of a large membership, then sell the Society to the non-members and get one or more new members, and finally sell the engineering profession to the public. Then as engineers we can fully realize that we have a profession of which we can be justly proud.

One Engineering Organization

Mr. Arthur V. Sheridan, Editor
The American Engineer
415 Lexington Avenue
New York, N. Y.

Dear Mr. Sheridan:

I think it is a coincidence that Mr. I. E. Morris' letter to you asking the question "How can we make the public appreciate such things?" (The services that the Engineering profession contributes to the public welfare), and the article on Legislative Service appeared in the same issue of "The American Engineer"; because I believe the answer to Mr. Morris' question lies to a great extent in how we approach not only legislative questions but how the Engineering profession *as a whole* unitedly presents its case to the public.

Mr. Morris stresses the part that Structural Engineering plays in the design and construction of a large hotel, and when the job is completed it is the architect and not the engineer who gets the credit. In addition to Structural Engineering the fields of Electrical, Mechanical, Sanitary Engineering, and Steam and Air Conditioning Engineering also play major roles in the problems to be solved in such a structure. In fact in most major structures today all branches of the Engineering profession are intertwined in such a way that what affects one member surely affects all to a greater or less extent.

We find, according to the October issue of "The American Engineer", that the 1943 edition of "Trade and Professional Associations of the United States" published by the U. S. Department of Commerce states that the Engineering profession as a whole is represented by *six* (6) *different organizations.* The American Institute of Electrical Engineers, the Institute of Mining and Metallurgical Engineers and ten (10) other prominent Engineering Societies are not included. From this it is seen that at least 18 to 20 separate organizations are trying individually to tell the Engineers' story to the public.

As a contrast, the Medical profession is represented by *one* (1) *organization*—The American Medical Association; and the Legal profession is represented by *one* (1) *organization*—The American Bar Association.

Everyone knows that medicine and law have their specialties: such as, the eye, ear, nose and throat, surgery, pediatrics, obstetrics, etc. in the medical field; and criminal law, corporation law, general practice, civil law, patent law, etc. in the legal field. Yet when the Medical and Legal professions wish to handle a legislative or public relations question, state or national, it is the American Medical Association or the American Bar Association through which they act, not one of the minor specialty groups within the two larger organizations.

Why is not this the time to take an overall view of the entire Engineering field and have a society, institute or association which will be all inclusive for the entire field, educational, economic and social. All Engineers could get behind it and have the organization represent us to the public in general. I see no reason why existing societies cannot continue to function as particular groups inside the proposed overall association. Think of the added prestige we would have in Washington and in each of the 48 state capitols if one voice instead of twenty spoke for the Engineering profession in these locations.

The expense of public relations would be correspondingly reduced. According to the statistics in the table given in the October issue there are about 45,000 Engineers listed with a minimum of 135 on the various staffs—this means about one staff member to 335 society members. The Medical Association ratio is one (1) per 200; the Dental Association one (1) per 1300; Lawyers one (1) per 1200, so that without too much additional cost we could put ourselves even in the American Medical Association class if we get together and work as a unit instead of an uncoordinated group of individualists.

It seems to me that the time to act is now. Why not have the National Society of Professional Engineers start the movement? United we can progress in public esteem—separated we will continue to occupy a secondary position.

Yours truly,

E. S. Fenelon, P.E.

Pittsburgh, Penna.

The Engineering Profession

By H. E. Nold

President National Society of Professional Engineers

The engineer is responsible for the development of much that has fundamentally improved our mode of life. The works of the engineer are well known. The engineer and the engineering profession are not so universally recognized. Today, engineering as a profession is winning its due recognition.

Not every technically competent engineer belongs to the engineering profession. A man may, by technical training and experience, be able to solve intricate engineering problems and yet not be a professional man. He may be only a competent technical, mental machine. The realm of true professionalism goes far beyond mere technical competency. In addition to technical proficiency, professionalism implies the willing assumption of civic and social responsibility; the motivation of life to the end that humanity may reap the fullest possible benefit from engineering developments;—all this within the framework of a code of ethics, established and accepted by the engineering profession. Professionalism is more than technical proficiency, more than honesty—it is all these, plus willing service. It includes spiritual development and a complete acceptance of the responsibilities thereof.

The engineering profession is on its way. Professional consciousness among engineers is gathering momentum like a snowball rolling down a hill—it will not stop. The emphasis is changing from "What can and will my profession do for me?" to "What can I do for my profession?"

The National Society of Professional Engineers with its state units is truly professional and organized for service—service to society and service to the profession.

Fragments from

STATE & SOCIETY ACTIVITIES

CALIFORNIA

Transmits Roster

A copy of the 1944-45 Roster has recently been received from the California State Board of Registration. Among the items noted are: The Law, The Rules of the Board, a statement of expenditures and a complete financial presentation. According to the Roster there are presently 4332 Civil Engineers, 435 Structural Engineers and 590 Surveyors on the present rolls.

ILLINOIS

Approves Schedule

The Committee on Fees and Salaries has submitted a report "Schedule of Minimum Engineering Fees and Salaries" which was approved by the Board of Directors and will be published soon.

This report was prepared after studying similar schedules of many State societies and the salary range recommendation and specifications supplied by the Department of Finance, State of Illinois. It contains six chapters, namely: (1) Minimum fees for general engineering services, (2) Minimum fees for civil, mechanical, structural, electrical, consulting services for building construction, (3) Standard form of agreement between owner and engineer for professional services, (4) Schedule of salaries for professional engineers in Illinois, (5) Schedule of salaries for professional engineers in public employment, and (6) Code of Ethics.

Legislation

The Legislative Committee of the Illinois Engineering Council has prepared a new bill for the registration of engineers to replace the law voided by the Illinois Supreme Court as unconstitutional. It has put the draft of this bill into the hands of its legal counsel to determine if this draft confirms to the conditions set up in the decision of the Illinois Supreme Court.

INDIANA

Society Gains

A recent issue of the Indiana Professional Engineer lists the following new members: Ross J. Buck, Consulting Engineer, Edinburg; Daniel P. Dumont, General Dist. Engineer, Marion; High D. Fatout, Vice-president, Hugh J. Baker Co., Indianapolis; Ed Grace, W. H. Sullivan Co., Greensboro, N. C.; Kendrick A. Hatt, Dept. Public Parks, Indianapolis; Harold D. Kelsey, General Electric Co., Fort Wayne; Edmund J. W. Knight, Bendix Aviation Corp., South Bend; William P. Lake, Aluminum Corporation of America, Lafayette; Joseph M. Micklitsch, State Highway Commission, Bluffton; John M. Moore, Consulting Engineer, Indianapolis; William J. Moore, U. S. Engineers, Syracuse, N. Y.; Donald B. Prentice, President, Rose Polytechnical Institute, Terre Haute; Keller P. Thiery, Street Engineer, City of Indianapolis; Charles R. Whitesell, Wabash River Ordnance Works, Terre Haute.

The same issue has an interesting editorial on "That Term Engineer!"

MINNESOTA

Committees Active

From the News Letter of the Minnesota Association comes the following selected items:

Employment Practices

Mr. McWethy reported for the Employment Practices Committee. Recommendations included:

a. Building up of a file of past M. A. P. E. activities in the economic interests of its membership, citing instances where it has represented members in regard to wages, hours and other employer-employee relationships.

b. Immediate contact with engineers involved when a case arises relative to engineering employees' representation. Authority will be secured to act in their behalf.

c. Carrying out the investigation, appearances and representations of the committee on a high plane of professional practice; its activities to be concerned with groups of engineers rather than with the grievances of individuals.

It was recommended that a petition be filed with the Wages and Hours Division in Washington by our national office, asking for a hearing on why professional engineers, along with doctors and lawyers, are not excluded from the provisions of the Fair Labor Standards Act.

University Contact Work

Ed. F. Jones reported on the University Contact Committee's work. After a discussion of the two-year-terminal courses, as previously reported, the committee also recommended the change of the standard professional course to a five-year basis. It was felt this would serve to increase the standards of the professional engineer through better training of graduates. The recommendations will be submitted to Dean Lind.

Legislation

The following change has been approved for Section III, paragraph 3 in the proposed amendment of the Registration Act: "An honorably discharged veteran of World War I or World War 2 shall be given credit for such experience or education gained in the armed services of the United States as meets the standards fixed by the Board."

A report on the collection of the Legislative fund shows the following: District 1—$54 of its quota of $63; District 2—full quota of $101; District 3, full quota of $58; District 4—$39 of its quota of $237; District 5—no remittance on quota of $282; District 6—full quota of $60; District 7—full quota of $66; District 8—$60 on quota of $83. It was agreed that for the time being, none of this money should be used to reimburse societies for expenses incurred in connection with meetings at which legislators were guests.

Chapter News

District 3

Some 18 members and guests gathered for the District 3 November 1st meeting at the Hotel Spaniol, St. Cloud. The State office was represented by President Stolte, Walter Wheeler and Dr. Richard Price. Mr. Wheeler reported on the current projects of N. S. P. E. and Dr. Price gave an interesting and philosophical talk to stimulate the pride of engineers in their own work. Election of new officers was a feature of the evening. Harry G. Elletson is now President; William E. Brown, Vice President, and H. C. Jahnke, Secretary-Treasurer. Delegates are Mr. Elletson, A. W. Moulster and Don R. Savage. Alternate delegates are Mr. Brown, F. C. Fredrickson and B. A. Johnson. R. T. Campbell was made a member of the State Nominating Committee, and Louis Knudsen, a Councilor. President Schmit presided.

District 4

Motion pictures of transportation activities on the Upper Mississippi made up part of the program of the October 20 meeting of District 4 at the Y.M.C.A. in St. Paul. President Klett pre-

sided. The State office was represented by President Stolte and Dr. Price. Ted Thompson, State Chairman of the Registration Committee, explained the proposed amendments to the Registration Law, and a lively discussion was started on various points.

District 5

"Public Speaking for Engineers" was the topic of Professor Gullickson of the University of Minnesota, guest speaker at District 5 October 27 meeting at the Y.M.C.A. in Minneapolis. Since it may be expected that members of the profession may be called on for public discussions in postwar expansion, it is timely that they hear from an expert on the right and wrong way of putting over a message. Joe Estabrook, reporting for the Public Policy Committee, submitted a suggested contract form for professional engineering services. After discussion, it was returned to the Committee for further study. Among the 34 members who gathered for the meeting was one who has been away too long—Arthur W. Nelson, just returned after a long stretch of war work in Michigan. The meeting closed on a particularly happy note, with the receipt of four applications and checks for membership. President Preus presided.

Two Year Short Course Approved

The following is an excerpt from the November 17, 1944, issue of the University of Minnesota news sheet, "Minnesota Chats." It deals with a matter of interest and importance to engineers.

"The Board of Regents of the University of Minnesota, meeting Nov. 4, established a group of two-year terminal courses in the Institute of Technology requested by the United States Veterans Administration, but open to other students as well as veterans, with the provision that those who have done well in the short courses may apply for admission to the regular professional program of instruction.

"The basic idea of the courses is to provide sub-professional training for students, particularly veterans, who wish to prepare for practical and applied technical work in industry, in the contracting and construction field, public works and engineering offices. Graduates will be, in effect, engineering aides. The courses will run for six quarters coincident with regular university terms."

NEW JERSEY

Notes of Trustees

The following are extracts from the minutes of the last reported meeting of the New Jersey Society Board of Trustees. Secretary-Treasurer Braun is the reporter.

Engineer Kelly reported that the State Registration Board is taking an active interest in the activities of the National Council of State Boards of Engineering Examiners under the leadership of Dr. Carl Swenson of Texas. He reported on Board activities as follows: From 1940 to 1944 the Board has considered 633 reported cases of violations and has closed 559 of them. Cases closed include: a—Applications filed and pending—40; b—Had licensed engineers in employ—53; c—Employed licensed engineers—66; d—Removed illegal listing or sign—166; e—Deceased—1; f—No longer in business—88; g—No violations as reported—28; h—Held for revision of law—36; i—Renewed license—6; j—Application filed and license granted—75.

The New Jersey State Registration Board suggests that each State should police the profession as is done here in New Jersey and that NSPE be advised accordingly. The Board has advised the County Judges and Prosecutors in New Jersey that Engineers as well as Architects have a registration law which must be observed. Engineer Kelly was warmly thanked for this fine report.

Business Manager Higgins reported that the January issue of the New Jersey Engineer will be the 1945 Convention number. It will be enlarged to 100 pages and will contain additional advertisements. About $7500 has been collected from ads to date.

Salary and Fees Chairman Hehn read an outstanding report on the Fees and Salary situation. His report, which will appear in the New Jersey Engineer in detail, embodies parts of the 1939 and 1943 Schedules as well as some brand-new ideas on this all important subject. This report caused some earnest discussion before the Board adopted a motion "to proceed along the lines outlined in this report." The Officers of the Society and the Salary & Fees Committee will collaborate in following out these recommendations.

Membership Chairman Daily reported 727 members in good standing on November 1, 1944. This does not include the Union County group meeting recently at which 45 applications were filed for membership. Hudson Chapter is the first to pass its 1944 quota. Raritan Valley will also pass its quota for 1944. President Krueger regarded the November first membership report as "most discouraging". Since the new Executive Secretary needs "a good start", President Krueger started his own personal membership drive. To date, President Krueger has received 98 replies, most of them accompanied by checks for membership dues. All Chapters are represented in these returns and President Krueger's initiative deserves the full support of all of us to "go and do likewise."

Chairman Kramer of the Executive Secretary-Headquarters Office Fund Committee reported that office facilities have been secured in the Wallach Bldg., Trenton. President Krueger was authorized to interview and engage one of three applicants as office assistant from $180 to $200 per month. To November 17th, Chairman Kramer reported $6791 pledged with $5470 in cash. President Krueger announced that the campaign will be continued until January first and appointed a new Headquarters Office Committee consisting of himself, Engineers Kramer and Kelly. The present committee will remain on call for consultation. The new committee will directly supervise the installation of the Headquarters Office and staff and report at each Board meeting. President Krueger is grateful for the full cooperation of Hudson Chapter in this drive but he wonders about the inertia in Essex, Monmouth, Ocean and Passaic Chapters. He expects each Chapter to report reaching its quota at the December Board meeting. President Krueger's remarks occasioned an earnest discussion. Assurances were given President Krueger that each Chapter will reac hits quota by January first, 1945.

For the Nominating Committee, Chairman Jacobs offered the following nominations: For President—Stephen G. Szabo, Trenton (Mercer Chapter); For First Vice President—Daniel M. Kramer, Woodbury, (South Jersey); For Second Vice President—Alonzo L. Jones, West Orange, (Essex); For NSPE Director—Hugh C. Clarke, Jersey City (Hudson); For NSPE Director—C. George Krueger, Jersey City (Hudson); for NSPE Alternate Director—Earl L. Daily, Woodbury (South Jersey); For Secretary-Treasurer—Frederick D. Braun, Ventnor City (South Jersey); For Trustee-at-large—Raymond P. Wilson, New Brunswick (Raritan Valley).

The Nominating Committee recommended "that serious consideration be given to the possible appointment (or nomination) for an Alternate Trustee-at-large." This recommendation is passed along to the incoming President for action.

NEW YORK

Board of Examiners of P.E.

Annual Report

During the year July 1, 1943 to June 30, 1944, the Board held 10 meetings and considered 860 applications for licenses, of which 35 were rejected, 393 admitted to the final examinations, 116 admitted to the preliminary examinations, 42 held for further consideration, 71 certified as having passed the preliminary examinations, and 203 recommended for licenses (118 by examination and 85 by long-established professional standing).

Ten applications of New York registrants for certification by the National Bureau of Engineering Registration were considered and of these 8 were recommended for national certification and 2 conditionally recommended.

The personnel of the Board as of November 16, 1944, date of this report, is as follows: Erich Hausmann, chairman; David B. Steinman, vice-chairman; Roy G. Finch, secretary; Norman R. Gibson; Irving K. Peck.

Statistical Analysis of P. E. Examinations in N. Y. State
(June 1942 to June 1944 inclusive)

	No. Taking Exams	*No. Passed*	*% Passed*
Graduates in C. E.	128	77	60%
" " M. E.	98	62	63
" " E. E.	61	38	62
" " Chem E.	24	16	67
Total Graduates	311	193	62%
Fracticnal College Credit	47	16	34
No College Credit	26	2	8
Total Entrants	384	211	55%

These figures show: 1.) that the examinations do not favor the graduates in any specific branch of engineering; 2.) that the graduates of accredited engineering schools fare much better than the graduates of non-accredited engineering schools; and 3.) that it is possible in exceptional cases for a self-educated man to pass the examinations, although only two out of 26 such entrants have thus far succeded.

The 311 entrants with full college credit were graduates from 63 different colleges or schools of engineering, all accredited. Of these, 23 engineering schools (with 1 to 5 candidates each) shows a record of 100% passing; 3 schools (with 7 to 47 candidates each) show 83 to 86% passing; 4 schools (with 7 to 23 candidates each) show 70 to 75% passing; 4 school (with 3 to 26 candidates each) show 54 to 67% passing; 8 schools (with 2 to 27 candidates each) show 25 to 50% passing; and 21 schools (with 1 to 6 candidates each) show a record of zero% passing. At the top of the list is a school with 5 out of 5 entrants passing; one school has 18 out of 21 passing, and another has 39 out of 47 passing; at the bottom of the list is a school, also accredited, with 6 entrants, all of them failing. This cumulative record, now covering 5 examinations, becomes more informative as the results of successive examinations are added.

For the Preliminary Examinations, the cumulative record now covering 3 examinations (June 1943 to June 1944 inclusive) is as follows:

	No. Taking Exams	*No. Passed*	*% Passed*
Graduates in C. E.	68	39	57%
" " M. E.	64	48	75
" " E. E.	19	6	32
" " Chem. E.	17	10	59
" " Aero. E.	3	2	67
Total Graduates	171	105	61%
Fractional College Credit	17	4	24
Total Entrants	188	109	58%

The 171 entrants with full college credit were graduates from 28 colleges or schools of engineering, all accredited. Of these, 11 schools (with 1 to 6 candidates each) show a record of 100% passing; 3 schools (with 6 to 28 candidates each) show 80 to 83% passing; 6 schools (with 2 to 14 candidates each) show 50 to 67% passing; 4 schools (with 3 to 27 candidates each) show 25 to 46% passing; and 4 schools (with one candidate each) show none passing. At the top of the list is a school with 6 out of 6 entrants passing; another school has 22 out of 28 entrants passing; and near the bottom of the list is a school with only 3 out of 12 entrants passing. The Preliminary Examinations constitute a direct test of the thoroughness of basic training in the different engineering schools, whereas the Final Examinations also test subsequent training. As this cumulative record is extended in succeeding years, the figures will be increasingly illuminating.

23 Years' Record of Board of Examiners

Since 1921, it is estimated that 24,000 applications have been received for P. E. and L. S. licenses in N. Y. State. Approximately 20,000 persons have been granted licenses to practice P. E., and about 20 per cent of these were also granted licenses to practice L. S. In addition, about 1200 persons have been granted licenses to practice L. S. only. On June 30, 1944, there were 13,610 persons registered as P. E., and 755 as L. S. only.

The present three-part final examinations went into effect in January 1938. Since then 2002 persons have entered this final examination (counting some individuals more than once), and 56 per cent passed, or 1130 individuals licensed by examinations in 6½ years.

From July 1, 1940 to June 30, 1944, the Board has considered 3431 applications (counting many of the individuals more than once). During this period, 615 persons secured licenses by passing the final written examinations, and 308 persons were granted licenses on long-established professional standing.

Since 1938, the record shows that in Part I of the three-part examination 84 per cent passed, in Part II 58 per cent, and in Part III 65 per cent.

The first preliminary examinations for Engineers-in-Training were given in June 1943. Since that date, 109 have passed and 79 failed.

Broome Area

During October the following new members have been added to the State Society through the Chapter:

Edward T. Adams	P. E.	Edward H. Klausner	L. S.
Matthew T. Lee	P. E.	Paul G. Baldwin	L. S.
George H. Dyke	P. E.	Harry E. Holford	P. E.
Henry H. Bassford	P. E.	William R. Brewster	P. E.
J. Paul Keen	P. E.	Francis J. Mulvaney	P. E. & L. S.
Elliot R. Ryder	P. E.	Allen T. Paine	P. E.
Ernest J. Pillotti	L. S.	L. F. Brough	L. S.

Insomuch as this list represents one month's effort, it is probable that the same has been increased during the months of November and December.

President's Message

While the year 1945 will have arrived before this issue appears, the following message of President McFarland has been suggested as timely, a thought with which the Editor agrees:

The year 1944 is fast drawing to a close and to most of us it is a year we are glad to see come to an end, for we are one year nearer the end of the war, with its headaches for those engaged in furthering the war effort; and for those with loved ones in the service, the end of the worry and the heartaches.

For the Broome Area Chapter, however, it has been a year of great progress. We are a much closer knit organization, much larger and much stronger. This has been due to the efforts of the membership as a whole who have worked together and achieved results that, to the rest of the chapters in the State, seem nothing short of miraculous. Some of our spirit appears to be reaching out beyond our own territorial boundaries, and we hope that it may be the spark which the State Society needs, to grow and become the organization it should and must become.

I take an intense pride in being President of the Broome Area Chapter, not the pride of possession of office, but pride in our strength and accomplishments, the kind of pride that makes us throw out our chests and say "The Broome Area Chapter is getting places." I am also very happy in the many loyal friendships I have made within our chapter. The statement has been repeatedly made that no engineer in our area can afford not to be a member of our chapter, and I find in my own case that this is an understatement. The help, kindness and consideration given by my fellow members cannot be overestimated, and I am deeply grateful for it.

As we approach the anniversary of the birth of the Redeemer, we become more and more conscious of our fellow man, his troubles, his problems, and his dreams. It is my heartfelt wish that for all of you the coming year may be the year of the realization of your hopes, the materialization of your dreams. To you and yours, a very Merry Christmas and a most Happy New Year.

William H. McFarland

Erie County

From Secretary Eldridge comes the following:

At the last reported business meeting of the Chapter, the newly elected president, John J. Landers officiated. As this meeting had been declared an open one many guests were present. Also present was Past President Norris C. Barnard. President Landers opened the meeting with a few words of welcome to our guests and a short address on what the society it. Past President, Norris C. Barnard, was then introduced and made a few remarks on his reluctance to leave and best wishes for the chapter's continued success. He also mentioned that Mr. Landers was succeeding him in office. President Landers announced the executive board

meeting and introduced Gust. H. Karlsteen as Vice President. The latter gave a few words of appreciation and announced that it would be necessary for him to relinquish the Chairmanship of the Membership Committee. His successor C. Arnold Dutton was introduced.

President Landers introduced from among the guests Schuyler Jenkins, President of Niagara County Chapter and George Gleasner of the Engineering Society of Buffalo.

President Landers introduced member W. E. S. Dyer who in turn introduced the speaker of the evening, Paul R. Sidler. Mr. Sidler is Resident Engineer of Brown, Boveri and Co. of Baden, Switzerland and gave a most interesting and educational discourse on the gas turbine. The history, development and possible future of this popular subject was most thoroughly discussed by Mr. Sidler. After the lecture a question period was announced but no questions were asked. A rising vote of thanks was extended to Mr. Sidler.

This meeting was declared the most outstanding for some years past. Eighty-seven persons attended the dinner with an additional 40 estimated for the lecture only.

Nassau County Chapter

Following are the officers for the year 1945: President, Henry Waldinger; Vice President, Robert McDowell; Secretary, F. X. Merklin; Financial Secretary, Kurt Groepler; Treasurer, Marvin C. Baldwin. Directors for the year 1945-1947: R. B. Dillenbeck, George Brown, Clarence MacCallum.

New York County Chapter

Programs for 1945

Chairman Anatole R. Gruehr of the Chapter Program Committee advises that during the coming year "several meetings will be devoted to discussions of contemporaneous economic and social problems and their interdependence with technological progress. This promises a really active and interesting year for the New York Chapter. All neighboring chapters in New Jersey and Connecticut, as well as New York, might find the following sufficient to warrant participation. Guests are always welcome Meetings are usually held on the second Tuesday of each month.

Program Outline — 1944-5

The Economic and Social Problems of the Post-War World

A. Broad Problems

1. Wages v. Profits—or Wages and Profits.
   Socialistic theory of profits—or private saving v. social saving.
   Profits are continuous only in expanding economy.
2. Technological Development—New Products, Methods, Processes—as the sole guardian of individualistic economy.
3. How can America compete in World Market with cheap foreign labor.
   Alternative—closed economy.
4. Impact of National Debt on National Economy.
5. Can America accept foreign goods and services in payment for her exports?

B. Specific Problems

1. Labor Relations
2. Reconversion of Labor—(New Processes / Reduced Man-hours per unit / New Products)
3. Reconversion of Plant
4. New Industries
5. A Flexible Program of Post-War Public Works as an essential adjunct of employment by private enterprise—A U. S. Dept. of Public Works.
6. The 30 Hour Week and Recreation.

Proposed Method of Discussion

In order to carry out a well organized discussion, it is proposed to adopt the following practices:

1. At the beginning of each talk distribute a number of 3x5 cards to the audience and ask that questions that arise during the talk be written down on those cards, *one question to a card.*
2. At the end of the talk assemble the cards and arrange the questions in accordance with the general interest value. In this manner, a question which occurs on several cards can be given precedence. Questions which do not bear directly upon the issues discussed, or which would have a tendency to provoke a non-productive argument, can be left to the very end. If time is short, they can be left out entirely.
3. At the end of the first program, it should be possible to announce the subject of the second program and suggest that some questions might be formulated in advance and submitted at the beginning of the meeting. The speaker might then find an opportunity to enlarge upon those issues in which interest is evidenced.
4. It is proposed that for the meetings of this nature, the business meeting be entirely omitted, or restricted to essential announcements the total time of which should not extend over 5 or 10 minutes. Reports of committees which are apt to be extended, and may provok some discussion, should be presented at the meetings to which no special speaker has been invited.

Schenectady Chapter

Chapter Meeting Policy

In compliance with a new policy, the business of the Chapter is being carried out at monthly meetings of the Executive Board. Five membership meetings will be scheduled during the year, some of which will be general meetings like the one held December 5th at which Prof. Bibber described his experiences in the land of the Nippons. Other meetings in this group will be planned at dinner-discussion meetings and the time and place will be announced to the membership.

Engineering Council

Our Chapter is one of the eight Engineering and Scientific Societies affiliated in the Schenectady Engineering Council and we are playing our part in committee work and the promotion of the Council's coordinated technical meetings. On October 26th, our Chapter sponsored the meeting of the Council which brought James Cleminshaw to Schenectady to discuss the pertinent subject of "Real Estate Reassessment".

The other members of the Engineering Council are: AIEE, ASME, AWS, SAE, ACS, ASTE, and ASCE. The Council has two representatives from each society, ours being N. L. Freeman and M. M. Cohn.

Our Chapter Grows

It is a pleasure to announce that 1944 has been a banner year for enrolling new members in the chapter. We are proud to have them affiliated with the Schenectady County Chapter, the State Society and the National Body. The new members for 1944 are: Frank Barclay, P. L. Alger, Jos. S. Beggs, F. J. Campbell, Roger W. Clifford, John J. Meehan, Anthony Headley, E. S. Lee, George E. Miller, Roy C. Muir, Jas. L. Roberts and P. J. Schwarzhaupt.

Westchester

Issues Bulletin

From the December Bulletin the following have been copies:

The meeting held on November 21st had about thirty members in attendance, all of whom were interested in "Electronics at Work" as presented by Mr. D. E. Sullivan of the Westinghouse Electric and Manufacturing Company. This industrial baby is a lusty infant, showing a three billion dollar volume in 1943, which puts it on a level with the automobile business. Electronics is defined as the "production of electric current through gases and vacuum". The electronic tube has many functions. It rectifies, amplifies, generates, transforms light into current and current into light—truly a modern wonder.

* * * *

The tenth annual convention of the National Society of Professional Engineers held in New York on December 1st and 2nd was attended by about 500 including ten members from Westchester. Space does not permit here to adequately report on the speeches and proceedings, but these will be published in full in the American Engineer, and are recommended for your serious consideration.

The editor can report for one, who was greatly impressed and inspired by the general air of satisfaction with the growth of the

professional movement since its inception ten years ago, and with the hopefulness and expectation of the progress which seems to be in sight in the immediate future. As stated by Engineer Steinman who was so largely responsible in the beginning, "to feel that a dream has come true is a matter of supreme satisfaction."

Even the "founder" societies which thought little of our efforts a few years ago, have begun to see the importance of a single professional society of all engineers, and they were represented at the meetings. The national membership is now about 10,000, and this is one in every seven licensed professional engineers. We have indeed begun to percolate, but this ratio should be reduced to one in three. 46 states now have licensing laws on the books.

All of the speakers stressed the need of the realization by engineers of the value and importance of their place in society and the dependence of civilization on the engineer for future developments. Industry as well as government is looking to the engineer for leadership, and we are urged to show an interest in economics and civic affairs as well as in technology.

Surely no better agency exists for us to acquire that leadership than through the promotion of the professional movement by our society. Starting with the chapter meetings our very democracy permits any member to become as active as he desires. By so doing he will develop the leadership ability so greatly needed. The sky's the limit.

Also for recommended reading see the article on "The Professional Man's Obligations to Society" by President Milton S. Eisenhower of Kansas State College (presumably General Ike's brother) in the November issue of the American Engineer.

OHIO

Taken verbatim from the Ohio Engineer for December are the following:

President's Letter

O.S.P.E. is becoming a bigger and better organization.

The year 1944 is drawing to a close and it has been a busy year. I think we may say also that it has been a successful year.

We have gained 19½ per cent in membership up to December 1.

The Chapters are active and have held many excellent meetings.

The Society committees have been functioning well.

Important material has been published. This includes the Manual of Chapter Activities, a reprint of the Registration Law, and (just published) the "Professional Engineer in Industry." The latter is an important new booklet explaining to engineers in industry the Professional Engineering movement and the Society.

Yet we are not through with our work for this year. On January 1, 1945, any members who have not paid their 1944 dues will have to be dropped from membership, since it is customary to allow only one year of grace in the payment of back dues. As of December 1 there are 421 such members. It is of the utmost importance that we do not lose these good men. Every Chapter President and every Chapter Secretary should make it his special job to get these members paid up before the year is over.

In addition, it is, of course, desirable to obtain as many new members as possible this month so as to make a fine growth record for 1944.

Let me thank you all very much for the good work you have done this year and wish you a Happy Holiday Season and a Prosperous New Year.

TOM ROLPH

Trustees Meet

(New officers nominated, new brochure presented, new membership slogan proposed, remission of dues considered for East Ohio.)

A well attended, lively board of trustees dinner meeting was held at the Seneca Hotel on the first Friday of December. President Rolph called the meeting to order with a Malay Gong furnished by Executive Secretary Chacey. There was the usual introduction of all trustees and guests present. The minutes were approved as read after which committee reports were called for.

Nominations: Chairman Moellenkamp presented the following names for the 1945 ballot: President—John Hale, Fred Hubbard; Vice President—Emerson Pettis, H. G. Nutting, Marvin Davis, A. C. Neff; Secretary—E. J. Salsinger, D. W. Converse; Treasurer—J. R. Shank, Earl Hoyt.

President Rolph called attention to the provision in the constitution for nominations by petition.

Treasurer's Report: Secretary Cornelius read the report which disclosed a deficit for the month of $318.14 but which still leaves us with a net of $6,074.92.

Public Relations: Chairman Hale urged the chapters to become more active and requested that the chairman of the Public Relations committees send him reports of their activities.

Citations: Chairman Kammerer submitted his report in writing. We have no citations for the year of 1944.

Engineers In Industry: Chairman Hubbard passed out copies of the new brochure, "The Professional Engineer in Industry". After expressing his thanks to all who helped he explained the "how" of the distributing the 10,000 copies which were printed. Members will each receive one copy by mail and more if requested. All answers to the open letter distributed to engineers in industry will receive a brochure as well as the registration act. The chapters will be supplied with all the copies they request for general distribution.

Postwar Planning: Chairman Swineford said we should encourage the preparation of plans. Past President Graf announced that the Franklin County Planning Commission is making a survey to find out which communities need funds in connection with help from the State. Graf urged the chapters to have their communities send names of communities and the amount of funds needed to Grover Clements or to the O.S.P.E. office which would forward the information to Engineer Clements.

Recodification: Vice President Hale, who had been named to represent the Ohio Society before the Highway Recodification Commission, reported that the Highway Department had appeared before the Commission concerning that part of the laws pertaining to the Highway Department. He announced that the Commission will consider at later dates both the Municipalities and the Counties as they are effected by the recodification. Engineer Hale thought that copies of the report could be obtained from the Senate Highway Committee-State House.

Executive Secretary: Chacey urged the creation of public opinion in favor of the Registration Act by getting the graduate engineers in Ohio registered this next year. Chacey suggested a membership drive at the same time and proposed a new slogan "5000 IN '45". (Will the Board adopt the slogan is the question?) Reporting for the membership chairman, Chacey reported an increase of 28 members for the month. The Executive Secretary was quite disturbed by the fact that many have not paid their dues for 1944 and anonunced that on January 1, all who have not paid their 1944 dues will be dropped from the membership rolls.

Dues: Engineer Oberle of the East Ohio Chapter (from which no 1944 dues have been received), after Chacey's reference to 1944 dues, presented a request for remission of dues. A lively discussion followed, lasting over an hour. The request was for the remission of the first three quarters of the year due to the fact that the local chapter had been totally inactive. It was pointed out that money rather than professionalism was being given first place. It was also argued that O.S.P.E. had not failed in it's obligations. Another was that a bad precedent would be established. Many sympathetic remarks were made. Past President Graf, who made a trip to Martins Ferry last year to revive the East Ohio Chapter, moved that the O.S.P.E. dues for the first three quarters of the year 1944 be remitted. The motion failed to carry. Trustee Pettis moved that the matter be put in the hands of the Chapter Relations Committee. This committee is trying to get someone to go to Martins Ferry to talk things over with the members there.

New Business: On recommendation of the Executive Committee Trustee Pettis moved that J. S. Kennedy be re-elected as our National Director. The motion carried. Trustee Coldren said his chapter objected to the fact that the National Society had but one nominee on their ballot. Trustee Neff related one of the Cleveland Chapter activities concerning a building code. President

Rolph announced that Ralph Greegor, Vice President of the Kinnear Mfg. Co., had accepted the general chairmanship of the Convention. Trustee Bischoff presented a drawing of an engineering insignia for use on autos. The meeting adjourned.

Chapter Activities

Akron—(Eighth meeting in 1944) From Secretary Sauter's minutes we find that a dinner was served to 62. Mr. Stanley Schultz spoke on "The Potentialities of a Third World War," committee reports were made and five new members were announced.

Canton—(After-dinner sing) From letters and minutes of Secretary Sperow we find that dinner was served to 49. Engr. Gerstacker led an after-dinner sing. A violations committee, and program committees for the next three meetings were announced. The N.S.P.E. was censored for its method of conducting elections. W. H. Hisey, manager of supervisional training for the Goodyear Aircraft Corp. was the speaker.

Cincinnati—(Most new members for the month) A lengthy report from Secretary LeFeber on the November meeting discloses that the attendance was 65 and that 10 new applications for membership were presented. The program committee presented J. C. Pitzer, of the Formica Company. Laminated Plastics was the fascinating subject presented by film and discussion.

Dayton—(The "Dayton Engineer" lists names of newly licensed engineers) Reminiscing about the last meeting and announcing the subject of city planning for Dayton for the next meeting the Dayton Engineer went on to cover personal items, unionism and registrants who are not members.

East Ohio—(Attendance prize given) Secretary Hartford says in his minutes for the November meeting that there was a delicious baked chicken dinner, 31 members and guests were present. H. M. Duff drew the attendance prize, and that Prof. J. V. Nelson, Superintendent of Schools, Bellaire, gave a very interesting and instructive talk on "Stalin the Man of the Hour."

Franklin County—(The Mayor of the City) The Columbus Engineer tells in interesting words, for the members who were not present, the highlights of the past meeting. It also announced Mayor Rhodes for the next meeting.

Mahoning Valley—(Largest attendance) President Hubbard submitted a copy of the proposed revision of the chapter's constitution. Secretary Stoll in his minutes said 68 were present for the meeting and that the speaker was H. E. Anderson, Senior Engineer of the U. S. Engineers, Pittsburgh, Pa.

Marion—(Postwar planning) Secretary Wittmer's minutes tell of a regular dinner meeting, the activities of the membership chairman and the talk on postwar planning by Mr. Michael, Secretary of the Marion Chamber of Commerce.

Maumee Valley—(Only newspaper publicity this month) Secretary Sims in his minutes, J. G. Snyder with his clever announcement and the 6-inch newspaper clipping all tell of a fine meeting. Collin M. Doyle, General Manager of the Gramm Trucker & Trailer Corp. of Delphos, spoke on the "Might of Russia."

Springfield—(Propellers and Propulsion) Secretary Steiniger in his minutes of the October dinner meeting relates items of chapter business and then tells of the talk by Assistant Chief Engineer John F. Haines of Aeroproducts Division, G. M. Corp., on propellers and jet and turbine propulsion.

Toledo—(Only an announcement) Secretary Clark announced C. L. Bougert of Toledo Industrial Rubber Company as a speaker on Synthetic Rubber.

Zanesville—(President re-elected) From the minutes of Secretary Painter we find that violations are being eliminated, the constitution being revised and that officers for 1945 were elected, with President Connar re-elected as the leader.

OKLAHOMA

Designers and Builders

To Plan For Post War Era

For the first time in the history of the State of Oklahoma groups of builders are to hold their several annual state meetings in Oklahoma City on the same days, January 12th and 13th, 1945.

The purpose of the parallel meetings and joint sessions is to outline needed legislation and publicity to insure an adequate and well balanced postwar construction program, coordinating the individual work being done by the several organizations. A legislative committee representing all collaborating organizations plans to offer to the Oklahoma Legislature its assistance in revising certain obsolete state laws that are retarding the construction program in the State of Oklahoma. The Oklahoma City Chamber of Commerce is cooperating 100 percent in assisting with the arrangements for this meeting.

Wm. Ritzhaupt, Chairman of the Publicity Committee, O.S.P.E., has received confirmation from all engineering founder societies indicating that they will cooperate; thus insuring complete coordination of our engineering societies activities.

The Oklahoma Society of Professional Engineers will hold its annual convention at the Huckins Hotel. The Oklahoma Association of Architects will meet at the Biltmore Hotel. The Association of General Contractors of America, both heavy and builders sections, for the State of Oklahoma, will meet at the Skirvin Hotel.

Each of these organizations has appointed one member to serve on the general coordinating committee, as follows: Earl Tankersley, A.G.C. Builders — General Chairman; Members — E. A. Richards, A.G.C. Heavy, Alfred D. Hill, Architects, Cecil Perkins, Engineers, Al J. Kavanaugh, Materials and Equipment. This committee is to make the arrangements for a final combined group meeting and banquet of all societies to be held Saturday afternoon and night, January 13, 1945 in the Silver Glade Room of the Skirvin Tower Hotel. The ladies auxiliaries of each organization will assist in promoting what will be the first meeting of this nature ever held in the State of Oklahoma. Attendance of 600 to 800 delegates is expected. Nationally prominent Engineers and Builders from each group will be in attendance to give Oklahoma planners the benefit of their experiences.

State Convention Program

Following is the program as of December 12th:

January 12, 1945

8:00 A.M.	Registration — Huckins Hotel
9:00 A.M. to 11:00 A.M.	Hearing on Report of Committee for "Schedule of Minimum Engineering Fees and Salaries for Engineers."
12:00 Noon to 1:30 P.M.	Forum Luncheon — Chamber of Commerce WKY Broadcast Guest Speaker
2:00 P.M.	Entertainment for Engineers' Wives
2:00 P.M. to 5:00 P.M.	General Meeting — Huckins Hotel Address — Hon. Robert C. Hefner, Mayor of Oklahoma City Response — Charles S. Larkey, President of Oklahoma Society of Professional Engineers General Discussion
6:30 P.M.	Board of Director's Meeting
8:00 P.M. to 12:00 P.M.	Dinner — Huckins Hotel Fun Session (Ladies Invited)

January 13, 1945

All Day Meetings of Architects, Biltmore Hotel, Contractors, Skirvin Hotel, Equipment Men, Huckins Hotel; Engineers and Founders Societies, Skirvin Hotel.

8:00 A.M.	Breakfast — Presidents and Delegates of Founders Societies — Huckins Hotel.
9:00 A.M. to 12:00 Noon	Closed Business Session O.S.P.E. — Huckins Hotel Committee Reports and Discussions President Address — Engr. Charles S. Larkey Report of annual election and introduction of new officers and directors New Business
12:15 P.M.	Luncheon — Huckins Hotel — KOMA Broadcast — 15 minutes Guest Speaker — Edward Larson, Executive Secretary, National Society of Professional Engineers

2:00 P.M.	Entertainment for Ladies
2:00 P.M. to 4:00 P.M.	Venetian Room (Roof) Skirvin Hotel Joint Meeting of all groups Discussion: Postwar Planning and Legislation Guest Speaker: F. T. Brown, Chairman, Citizens Postwar Construction Council of Kansas City, Mo.
4:00 P.M.	Board of Directors Meeting, Oklahoma Society of Prof. Engineers Architects postwar planning and Oklahoma Geological Survey display will be on exhibition.
7:45 P.M.	Dinner — Skirvin Tower Hotel — by ticket only ($3.00 each)
8:30 P.M.	Introduction: Oklahoma Governor Bob Kerr to introduce Guest Speaker, William Muirhead, President, National A.G.C.
9:30 P.M.	Floor Show
10:00 P.M. to 1:00 P.M.	Dancing

PENNSYLVANIA

Executive Board Meeting

Published herewith are extracts from the minutes of the November 18th meeting of the Pennsylvania Society, as reported in the minutes thereof:

A letter from the National Society advised "Professional Engineer of itself is a legal term and is defined among the legal profession as "one licensed to practice professional engineering." They had this on authority of their legal counsel. Therefore, there can be but one kind of professional engineer. To use the term "registered professional engineer" is to imply that there are other kinds. Consequently the addition of the adjective "Registered" neither qualifies nor adds authority to the legal term "Professional Engineer." Engr. Larson stated he had listened to extensive discussions of this in many places and has heard legal opinions expressed by the legal counsels of the Oklahoma Society, the New Jersey Society and the National Society and he is convinced by what they say that to attempt to embellish "Professional Engineer" tends to obscure the meaning.

Engr. Lawrie moved to rescind the former action of the Board in view of the fact that it is contrary to legal opinion of the N. S. P. E. and the State Registration Act. Seconded by Engr. Synder. Motion carried.

Engr. Sacks advised that all Chapters should be incorporated in the county where office is, to avoid any legal action against individual members of the Chapter.

Details of a new act were discussed and it was the opinion of those present that a meeting should be arranged between Engr. Sacks, Attorney Fertig, representatives of the Department of Justice and the Department of Education, and the members of the Registration Board, to go over the proposed act in detail. The meeting is to be arranged for by the Executive Secretary.

Engr. Lawrie reported that President Sutherland, Engrs. Hudson, Conrad, Fuller and himself recently met with all the members of the State Registration Board on Oct. 24th and had a very satisfactory discussion with regard to registration and especially as to our relationship with the Board and our desire to let the Board know that we had definitely backed it in the situation with the Governor and it was our intention to continue to work with it. We suggested to the Board that it be more considerate of the applicants, especially the manner in which the applicants are advised of their rejection for registration, than has been the case heretofore.

The question of examinations was discussed and we found that the Board was agreeable to giving examinations, especially in doubtful cases the applicant should be permitted to take an examination before registration was denied. In discussing the surveyors, the Board was of unanimous opinion that the surveyors should be included in the new Act and considered a branch of engineering.

Chairman McCormich of the Nominating Committee reported the committee met prior to the Board Meeting and nominated the following officers for the coming year: Samuel Baker, Northeast Chapter, President; LeRoy Christian, Reading Chapter, Vice-President; Victor J. Snyder, Harrisburg Chapter, Vice-President; Ray Fuller, Philadelphia Chapter, Vice-President; Robert G. Pfahler, Johnstown Chapter, Vice-President; J. J. Paine, Pittsburgh Chapter, National Director.

The report was received and upon motion by Engr. McCormick, seconded by Engr. Shoffner, the motion carried and the Secretary, after securing their consent to serve, was instructed to prepare the ballots for submission to the membership.

Engr. Sacks reported that eight members of the Architects Society and President Sutherland and Engr. Carpenter of the P.S.P.E. met with Engr. Warlow, Messrs. Stinson and Woolworth of the Department of Property and Supplies, three members of the Attorney General's office and Miss O'Hara, Secretary of Welfare, in Engr. Warlow's office on Friday morning, November 17th, at 10:00 A. M. and had an all day session. Each major suggestion made by the Architects and Engineers was accepted. The State will have one contact which the various bureaus will have to use.

President Sutherland, Engrs. Rahn, Parry, Hammaker and Conrad met Friday evening, November 17th, and decided to conduct the Annual Meeting to be held January 19 and 20th, 1945, along the same lines as last year; committee meetings to be held at 7 P. M. Friday evening, Executive Board Meeting at 9 P. M., and Annual Meeting at 9 A. M. Saturday morning with luncheon at noon. It was suggested to have music during the dinner and Mark James was suggested as a speaker in view of his connections with post-war planning.

Harrisburg Chapter

The last issue of Sparks at hand, as the January material goes to the printer, is the November Number which was received on the 17th of that month, too late for inclusion in the December American Engineer.

An interesting comment from Sparks is the following:

Under date of October 18, 1944, chapter members received a ballot to vote, for or opposed to certain proposed amendments to the Constitution of the Pennsylvania Society of Professional Engineers. These amendments are to *Article IV. Membership*, Sections 1, 4, 10, 11.

The 1st section now includes Surveyors, for which everyone has the privilege to signify his approval or disapproval. The inclusion of Surveyors will undoubtedly build up membership and strength, however, in April 1944, the Chapter voted to strike out the word "Surveyor" in the "Expanded Code of Ethics". Have we had a report on the disposition of the "Expanded Code of Ethics"? Is it consistent and right to admit Surveyors to full membership? Are all members ready and willing that Surveyors should have a vote in deciding matters that strictly pertain to Professional Engineers?

Now is the time to discuss and decide the procedure to be followed if and when Surveyors are admitted to the P.S.P.E.

Post War Planning

Recently Major General Philip B. Fleming, Federal Works Administrator, completed and submitted to Congress a detailed report on the plan status of postwar public works. General Fleming's report concludes that by far the most of the planning is in the "idea stage" while plans in the completed stage represent an estimated construction volume of less than a billion dollars for all forms of public works, excluding Federal Aid and State Highway Projects.

Federal Aid and State Highways are treated in a separate section of the report and show the following estimated volume of proposed work:

Plans completed for projects	$ 219,151,000.00
Projects in the design stage	957,242,000.00
Projects in the preliminary stage	1,018,101,000.00
Projects in the idea stage	2,419,722,000.00
Projects undistributed	92,592,000.00

You will note the completed projects represent a very small percentage of the whole coming under this group.

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Professional Development of the Engineer

(Continued from Page 10)

tangible attitudes, appreciations and points of view that are common to the highest expression of professional service. The report of the Committee on Engineering Education after the War defines them categorically as follows:

Consciousness of the engineering fraternity as a functional group in society engaged in constructive work of a common nature, using a common method of thought, and inheriting common obligations.

Appreciation of the heritage of knowledge and art, of standards of performance, and of the traditions of group action for professional development.

Recognition of the confidential relationship between agent and client, of the principle of fair play between colleagues, and also of the encompassing social duty to the public of service adequately and honestly given.

Loyalty to the principles of professional ethics not alone according to the canons in which they have been formulated but also according to the spirit in which they have been conceived.

Obligation to serve the profession in the advancement of its science, technology, and art and also in the discharge of its broad social duty.

Progress toward the achievement of these objectives has been made through the standards of qualification and of conduct which have been formulated by enginering societies and registration boards. Over and beyond the specific canons of every profession three rests, however, the great moral obligation to place excellence above quantitative considerations, loyalty above individual aspirations and service above professional gain. Through the individual adoption of such points of view and attitudes will grow pride in belonging to the professional group, devotion to the ideals which it advocates, and acceptance of the obligations which it has inherited and recognizes.

At no time in history have engineers been more realistically conscious than at present of their problems, of their unique services, nor of their common ideals and obligations. The reconstruction of our nation after the War presents a great challange and opportunity to them. We may all have confidence that they will accept the challenge, embrace the opportunity and raise the position of their noble profession substantially above previous levels of service and esteem.

Role Of The Engineer In This War

(Continued from Page 18)

they are misused, they will spell the end of our civilization. It is for us, therefore—the men of science—to impart to our fellow citizens an understanding of this inexorable fact. We must see to it that our statesmen, diplomats, and military leaders—in shaping the world of tomorrow—take the advice of the engineer and credit his vision of the technology of tomorrow. Only then can plans be practical and workable.

In the past, statesmen tried to build a world of tomorrow based on the technology of yesterday. That is why their plans eventually became impractical, collapsed, and led to war. Let us, therefore, become aware of the tremendous power that we, as engineers, wield and of the responsibility that rests upon our shoulders. If we give the world the instruments of science, we cannot shirk our share of responsibility in their use. It is with the proper use of scientific power that the answer lies as to whether our civilization will perish or survive.

The Engineering Profession

(Continued from Page 13)

the existing collective bargaining order has been obtained and new legislation has been agreed upon by the organizations and submitted to the Minister of Labor for the approval of his Department.

This new order would remove the engineers from the influence and dominance of trade unions. Personally, I feel that the engineers should be the arbitrators between management and labour. They know the aspirations of both and they understand the economics of production.

Unfortunately the present tendency of trade unionism is towards the strong arm methods and away from the spirit of the guilds and away from the pride in achievement. The discussion now taking place in labour circles is of such a nature as to dampen the professional ideals of the young engineer.

WHAT'S NEW

And Coming In The Whirl Of Change

(News from industry — gathered by the publisher)

LARGEST POWDER METAL BEARING

Striking evidence of progress in the art of producing self-lubricating bearings from powder metals is exemplified by the 96 pound bearing shown below —the largest ever produced from metal powders—being measured by Violet Wachnowski, a worker at Chrysler Corporation's Amplex Division. Oilite bearings of this size can be machined from the latest and largest Oilite cored bars now being produced. Rapid strides in the development of techniques to produce such big units from fluffy metal powders is indicated by the fact that the maximum size only a few years ago was less than five pounds.

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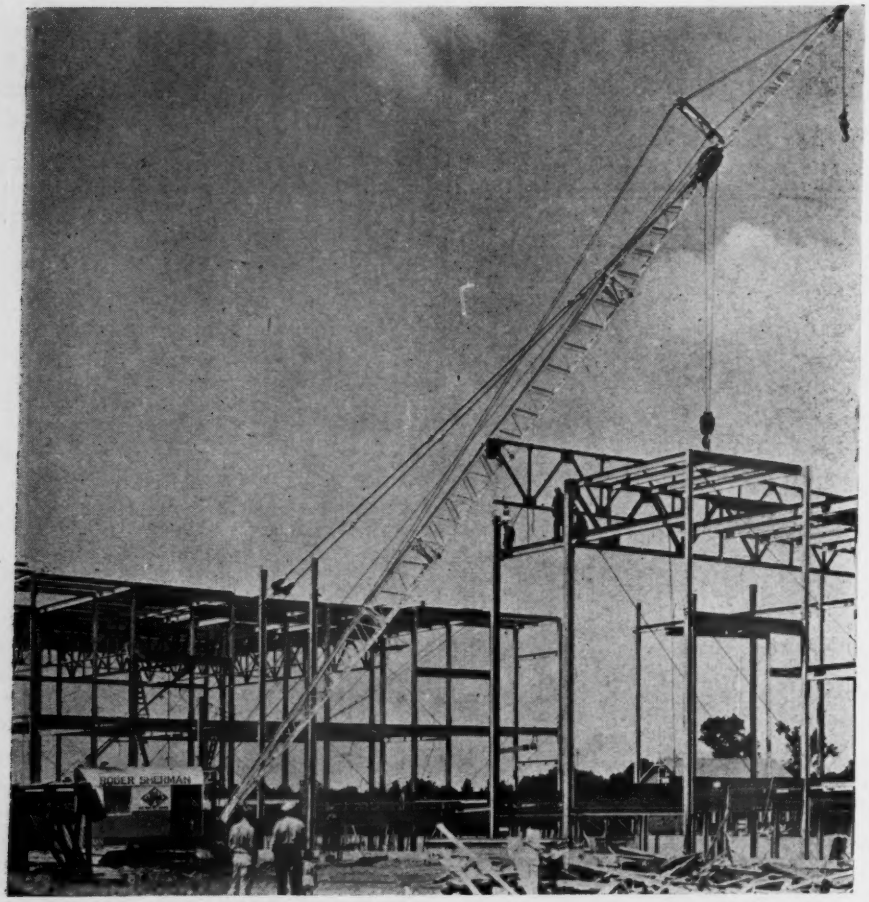

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INDIANA COMPANY PLANS STANDARD STEEL DREDGES

Hydraulic, dipper and clam-shell dredges of completely integrated and standardized design have passed the blue-print stage and are to be scheduled for production at the Fort Wayne plant of the American Steel Dredge Company, as soon as present committments on barges for the Army will permit. This announcement was made by Walter W. Walb, General Manager of the Company.

All dredges will have bolted sectional steel hulls and are so designed that all sub-assemblies and equipment can be conveniently transported overland to remote locations, or shipped to foreign countries as hold cargo. The largest single, component unit can be handled by portable crane equipment.

By standardizing the hull sections and carefully planning the distribution of the weight of power plant and operating machinery, it is possible to effect substantial savings in production time and material costs, while in many cases increasing the over-all efficiency of the units.

The line of standard dipper and clam-shell dredges will have a capacity range from ¾ to 3 cu. yd., and will be powered by Diesel, steam, Diesel-electric or electric prime movers. The hoists will be rigged for either two-part or single line operation. On some of the smaller units the booms are interchangeable, making the dredge quickly convertible from dipper to clamshell type of operation.

TELECHRON ANNOUNCES EXPLOSION PROOF MOTOR

A new explosion proof electric motor has been developed by the Warren Telechron Company, (Ashland, Mass.) according to an announcement by Roy W. Johnson, vice president.

This motor is totally enclosed in a bronze casting with removable screw cover and adapted for explosion proof conduit mounting. It can be supplied in various shaft speeds, voltages, and frequency.

This explosion proof motor was developed primarily for use in connection with automatic controls used in industrial processes where atmospheres containing ethyl ether vapor, gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors and natural gas are found. The motors have already been used in some of the large war plants producing chemicals, synthetic rubber, high-octane gas, and ammunition.

The motor carries Underwriters' approval label, Class 1, Grade C and D, for hazardous locations.

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